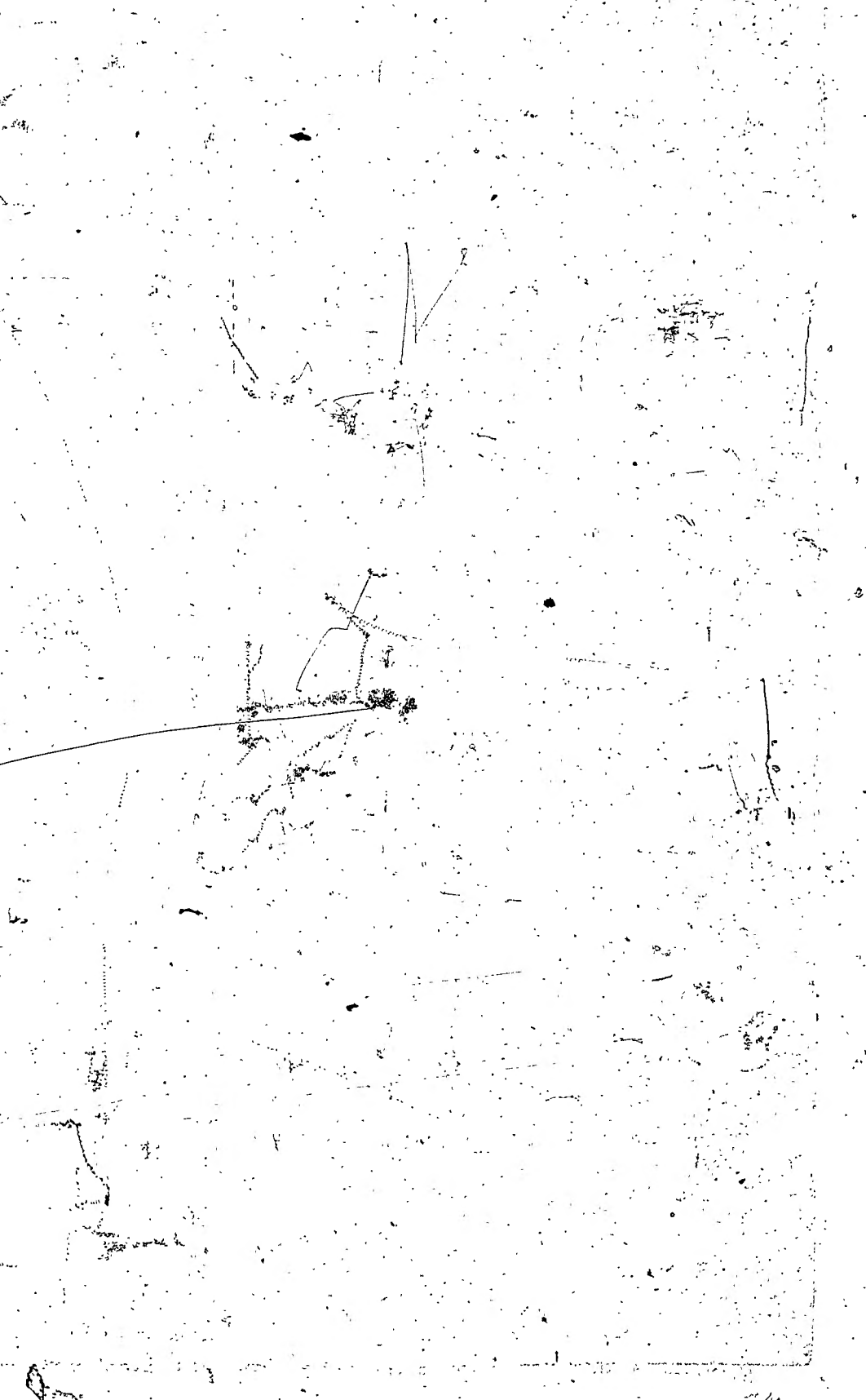

MINUTES OF EVIDENCE

TAKEN BEFORE THE

SELECT COMMITTEE OF THE SENATE

APPOINTED TO INQUIRE INTO

ALL MATTERS RELATING TO THE

CANADIAN PACIFIC RAILWAY

—AND—

TELEGRAPH

WEST OF LAKE SUPERIOR.

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1879.

CANADIAN PACIFIC RAILWAY AND TELEGRAPH.

MINUTES OF EVIDENCE.

THE SENATE, COMMITTEE ROOM,
MONDAY, 31st March, 1879.

Committee met this day, and—

Mr. MARCUS SMITH, C.E., being called and sworn, was examined as follows:—

By the Honorable Mr. Macpherson:—

Q. You are the acting Chief Engineer of the Pacific Railway?—Yes; and I have been so for the last two years or more.

Q. The Committee desires to get information from you as to the cost of the railway, so far as it has been constructed, from Lake Superior westward. The first section beginning at Fort William or the Kaministiquia, is known as contract No. 13?—Yes.

Q. What is the extent of that work?—When those contracts were let I had nothing to do with the work on this side of the Rocky Mountains; all I know about that is from the documents on which the contract was let, and from having visited the works since.

Q. How far does contract No. 13 extend from Fort William?—The contract No. 13 originally extended from Fort William on Lake Superior, to Shebandowan, a distance of forty-five miles. During the progress of the work, or soon after the work was commenced, there was a diversion made from the located line, from a point called Sunshine Creek, 32½ miles from Fort William. The contractors had the option of stopping at that point without finishing the 45 miles. They elected to stop at that point, so that 32½ miles ends the contract.

Q. Why was the line changed?—I only know from what I have heard about it, and from what I have read in the office. It was understood, I believe, when the line was taken to Shebandowan, the water communication was to have been used through the chain of lakes, by what is known as the Dawson route. Subsequently, after the contract had been let, a survey was made further north, crossing the Winnipeg River at the outlet of Lake of the Woods, not using those waters at all.

Q. The rail route was then adopted?—Yes.

Q. That was the cause of the change?—Yes.

By the Honorable Mr. McLelan:—

Q. What was the date of that change?—I have not got it here, but if you will allow me to make a note of it I will supply it from the office.

By the Honorable Mr. Macpherson:—

Q. Were the works let for a lump sum, or on quantities?—They were let on what is called a detail system, on a schedule of quantities of each class of work, and price rates put to those—the contractor to be paid by measurements according to the quantities executed.

Q. Was the country thoroughly explored and the line carefully surveyed before the quantities were scheduled and the contract was let?—I had no charge of that work, and I can only speak from what I have seen. It would appear from the profiles that it had not been thoroughly surveyed; that the contracts, in fact, were let on the rough trial survey. I know that fact from the contractors' claim having been submitted to me, and all these facts were elicited in evidence,—that immediately after the contract was let, they began the location of the line; the line was not located when the contract was let, and the works were not executed on the line on which the contract was taken.

Q. What was the estimated cost according to this schedule?—The estimate of the cost from Fort William to Shebandowan was $406,194. That was for the 45 miles.

Q. How many miles were built on that line?—About 32½ miles.

Q. What would have been the proportionate cost for that?—Assuming that the character of the works was something similar, which I believe it was, it would be in the proportion of 32½ to 45. Working out the item by proportion, the cost to Sunshine Creek, 32½ miles, would have been $293,350.

Q. I see by Mr. Fleming's report that the approximate estimate was $270,796. What amount was expended upon the work at the date of the latest return?—$331,979.51.

By the Honorable Mr. Penny:—

Q. Is that upon this new line?—That is from Fort William to Sunshine Creek, 32½ miles.

By the Honorable Mr. Macpherson:—

Q. Are the works completed?—Yes. I may state that that sum includes an award that was made to the contractors beyond the estimate by measurement. They made some claims which were submitted to me last summer for delays and changes, and I awarded a certain amount; I do not remember exactly how much, but some ten or twelve thousand dollars. I have included it in this, so that it is the total cost of that section.

Q. And they have no further claim?—No.

Q. How do you account for the increased cost of $60,000?—There are only two ways of accounting for it. Either the original quantities must have been wrong, or the measurements returned for the contractors must have been wrong. There is no other way of accounting for it.

Q. Have you brought the schedule of quantities as estimated, and the quantities returned as having been executed?—Yes. (The papers produced and fyled as Exhibit A.)

Q. In what items are the chief increases?—I think it is chiefly in earthwork. It is difficult to say, at a glance, how it occurred, for the schedule was for 45 miles, and the work executed was only 32½ miles. I would have to work it out in proportion. But I know the increase is principally in earthwork and something in rock work.

Q. How much did the cost exceed the estimate?—The difference would be $61,183.

By the Honorable Mr. Cornwall:—

Q. What was the cost per yard for the excavation of earthwork?—It was paid according to tender, 23 cents per yard.

By the Honorable Mr. Penny:—

Q. Is the iron included in this contract?—No. This only includes the grading. I might have continued my answer a little more fully. There must have either been an error in the original quantities, or an error in the quantities returned for the contractor. It was my duty to enquire strictly into that, not considering the claim of the contractor. I went over the amount, and I questioned the engineers in charge very closely. I had, previously to that, given them written instructions, tables and other forms and checks, so as to ensure, if possible, accurate returns. I came to the conclusion, on that occasion at least, that the returns have been pretty nearly correct.

By the Honorable Mr. Macpherson:—

Q. Returns made for the contractor?—Yes. On enquiry into the cost of the difference in quantities, I find that the original quantities had been taken out on the profile. That was only on a trial line, without cross-sections, and, of course, without any information as to the depths of the swamps and wet places they had to cross. I believe the error was principally in the original quantities; at the same time I cannot be positive that the returns are correct.

Q. Could the quantities have been ascertained at all without cross-sections having been taken?—They could not. An approximate return, even, could not have been made.

Q. Could returns be obtained now?—They could be approximately ascertained. The only places where it would be difficult would be in swampy ground, where the embankment may have sunk down, and where the ditches may have partially closed in or widened.

Q. Do you consider the prices placed on the several items in this contract are consistent and reasonable?—Yes. I think in this contract they appear to me to be consistent. The prices were altogether rather low; but that does not matter; they are consistent. There has been no attempt to gain an advantage by putting a high price on one, and a low price on another portion of the work.

Q. What is the rate for earthwork?—Twenty-three cents per cubic yard; solid rock, $1.25, and for loose rock, 50 cents. These are very reasonable prices. Clearing, $20 per acre; close cutting, $40; grubbing, $60.

Q. What is the width of the embankment to be according to specification?—Seventeen or eighteen feet. I have not got the specification just now. Mr. Fleming has it among his papers, and I thought he was coming over here to-day.

Q. Was that the width at the formation level?—Yes. Before the ballast was laid on.

Q. Were the embankments executed to that width?—They were executed to that width, but I found, in walking over the line, there had not been sufficient allowance for shrinkage and subsidence, and the embankments are rather narrower than that.

Q. What width are they?—I should not think they average over 14 or 15 feet; that is, at any considerable height. In low embankments, of course, there would not be the same shrinkage.

Q. If they had been constructed to the full width, how much more would the earth excavation have been increased?—I have not made the calculation. We would have to take cross-sections for that over the whole line, as the embankments vary in width. Some places there might be the full width and in others they would not be over 14 feet. I have found from experience that a shrinkage takes place of from 10 to 25 per cent on clay ground, according to the nature of the clay, and in swampy ground, where the nature of the soil is spongy—something like peat—there is from 20 to 100 per cent. shrinkage of material. That is to say, an embankment of 100 yards consolidated, would take, in some places, 200 yards from the ditch to make it.

By the Honorable Mr. Penny:—

Q. How are the contractors paid. Are they paid from the measurement as they leave the work, or are they paid for the measurement after the shrinkage?—They are paid for it as taken from the cuttings. That of course, includes the large measurements.

By the Honorable Mr. Macpherson:—

Q. Have you the means of ascertaining approximately how much the excavation would have been increased had the embankments been made the regular width?—No; measurements would have to be made all over the line; I could not do it from the profile.

Q. Could you not ascertain it approximately?—If we could agree as to the breadth of the embankment we might. The height of the embankment is about right. It has been kept up; I had returns made about two years ago, when I issued instructions as to the manner in which the books were to be kept, so as to have all returns at the completion of the section, and to have new plans and new profiles made of all the works, and new plans of structures; in fact, a complete set of plans of the works as executed, to be sent to the head office at Ottawa, for registering. We have received those plans of that section.

By the Honorable Mr. Penny:—

Q. I asked you whether the contractors were paid according to the work done before the shrinkage takes place and you said "Yes"?—The measurements are made from the cuttings, whether in line cuttings or in side ditches.

Q. What I want to ask you is this: supposing the bank to be, as you say, fourteen or fifteen feet now instead of seventeen or eighteen feet, as it ought to be, it would not follow from that that the contractors had been paid too much?—No; it would not follow from that fact, but still it makes the discrepancy between the original quantities and the final estimates so much more. It is no fault of the contractors that the banks are not sufficiently wide. It is the want of attention on the part of the engineer who was in charge, that the banks were not made up to a sufficient width to allow for the shrinkage.

By the Honorable Mr. Scott:—

Q. In one of those swamps or muskegs, how long does the shrinkage go on?—There are two causes—subsidence and shrinkage—they operate both the same way; it depends on the depth of the swamp how long it continues. If you have a deep swamp and a heavy embankment, it may go on for years; but we have nothing like a morass in that section. It is simply soft ground, with peat of a spongy nature on the surface. Of course when the embankment is made of that material it contains a large per centage of water, and if that water dries out, the bank sinks down by the the weight of the material.

Q. There is one answer made as to what the contractor was entitled to, you spoke as though he got the largest bulk?—Yes, he has.

Q. He does not get the full figure on the estimates as they go on?—The work is measured according to specification which directs how the contractors are to be paid. They are to be paid by the measurement of the place from which the material is excavated, not from the embankment. Secondly, they get the largest amount in case of shrinkage. In rock cuttings 100 yards of rock cutting will make more than 100 yards of embankment, because the stone does not lie so closely together after it is separated. But the contractor is paid in all cases by the measurement of the place from which the material is excavated.

By the Honorable Mr. Christie:—

Q. Have these embankments been added to since the completion of the work by the contractors in the first instance?—I have given directions in some cases to add to them. In other cases I have directed ballast to be added, instead of widening the embankment with earth.

Q. What difference did that make as to the original quantities?—It did not alter the quantities of earth but it altered the quantity of ballast. The reason I did this was the embankment was of a peaty nature in some parts, and it was on fire in some places. I had the whole of the embankment covered with gravel in order to prevent it being consumed.

Q. Has that added to the cost of the embankment itself? What proportion has that added to the cost as compared with the original estimate?—It comes in, in the other contract. Contract 13 was simply for bridging and grading up to formation level. The ballasting was included in contract 25, the next contract to it. There was not very much of this done. Those banks were in some places very low, perhaps a couple of feet, and as they were on fire they had to be ballasted.

By the Honorable Mr. McLelan:—

Q. In section 13 the earthwork is given at 23 cents, and in section 25 the ballasting is 38 cents a yard?—It is thirty-eight cents.

Q. Then, there is a difference in widening the embankment from 13 to 17 feet by ballast instead of earth?—There was very little of it done on section 13. The difference between ballasting on that section, and Purcell & Ryan's work was between 33 cents for earth and 38 cents for ballast, a difference of five cents.

Q. But the contractors for section 13 should have filled up to 17 feet. You say that they did not do so, but that the contractors for section 25 are doing their work at 38 cents?—There was very little of section 13 done that way. The banks were not ordered to be wider than 13 feet by ballasting. Before they came under my control section 13 was finished nearly. I am speaking more of section 25, where I ordered the width to be increased, but there were parts of section 13 that I ordered to be widened. There are two contracts, 13 and 25, for grading. The first extends 32½ miles for grading alone. The next contract to that is 25; it extends from that point about eighty miles on, for the grading; but the ballasting and track laying covers both sections, the whole distance from Fort William to English River.

By the Honorable Mr. Macpherson:—

Q. I see that Purcell & Ryan got a higher price for earthwork on section 13 than Sifton & Ward got?—No.

Q. Purcell & Ryan's rate was 26 cents, while Sifton & Ward got only 23 cents?—Sifton & Ward's price was 23, and Purcell & Ryan's price was also 23, for earth, on section 13.

By the Honorable Mr. Scott:—

Q. They got the same price for everything?—It was an arrangement between themselves, and it was accepted by the Government. Purcell & Ryan got the same rates for finishing section 13 as the original contractors had.

By the Honorable Mr. Penny:—

Q. It appears from what you say that as the work progressed it was found to be more difficult, and required greater quantities than expected?—I do not know that; I cannot answer that without having the profile before me.

Q. I only wanted you to recall what I understood you to say before, that in consequence of the work not having been properly surveyed in the first instance, the actual quantity of earth that was removed, turned out to be very much more than was estimated. The question I want to ask is this: supposing that the precise quantities had been estimated beforehand, would the work have cost any less than it actually has cost?—I do not know; it depends upon which side the mistake has occurred.

By the Honorable Mr. Macpherson:—

Q. I understand Mr. Penny's question to be this: if the estimated quantities had been as great as the quantity actually executed, would not the cost of the work been what it is?—If the work returned is measured correctly, it did not matter what the original estimates were, but there is the difficulty.

By the Honorable Mr. Penny:—

Q. Has the public lost anything by this mistake, supposing the true quantities were returned?—If we assume the returned quantities are correct, the public have lost nothing.

Q. Has there been a final measurement of this section?—Yes; this is a final measurement.

By the Honorable Mr. Scott:—

Q. Who laid out the line?—I do not know who made the surveys of the first line. They were under the direction of the late Mr. Hazlewood, and it came to my knowledge in settling the contractor's claim that the first estimates were based on a trial line; that the line was not located for construction at the time of the letting of the contract, and they had to begin locating the line after the contractors were there. In fact there is a claim included in that amount that the contractors have made for delays. They had all their men on the ground waiting for some weeks, before the engineers arrived to locate the line, and they claimed compensation for the men's wages and board during that time.

By the Honorable Mr. Macpherson :—

Q. Is the Committee to understand that the work was actually let before there was any accurate information obtained with respect to the probable cost?—Certainly; and I may explain that there is a considerable deviation from the original line, and the reason of that was, that the change of location improved the line, and very much improved the quantities (so it was alleged by Mr. Hazlewood), and I believe it did, as I have been over both lines myself. The new line is a great improvement on the original line. Still, the quantities are in excess of the estimates, and it makes it more inexplicable.

By the Honorable Mr. McLelan :—

Q. Then you believe on the original line the quantities would have been very much in excess of what they now are?—Yes.

By the Honorable Mr. Scott :—

Q. Was it Mr. Hazlewood who laid down the improved line?—It was done under his directions. Mr. McLennan actually located the line; he was the next officer to Mr. Hazlewood.

By the Honorable Mr. Christie :—

Q. Did I understand you to say, before letting the contract, the line was not located?—Yes; there were no cross sections, and no borings were made.

By the Honorable Mr. Scott :—

Q. Is it a matter of very much importance, where work is let out at so much per yard, that the exact quantities should be known?—It is of importance.

Q. Are you equally as particular as in letting work in bulk?—We have no check on those measurements unless the estimates are properly made beforehand. I cannot say now, whether the contractors have been very much overpaid, or whether the original estimates have been over estimated.

Q. You have got really to depend altogether upon the engineer who takes the measurements under any circumstances?—If the measurements are made correctly, and with great care, before the contracts are let they are made disinterestedly, and there can be no collusion between engineers and contractors, because no contractors exist. Then, afterwards, these measurements are a check upon the work as executed after it is given out to contract.

Q. What proportion of this line deviated from the original location?—There is hardly any of it exactly on the original location, though they are very near to each other; but the larger portion is a new line.

Q. Have you been over it yourself?—I have.

Q. Were you over the first line?—I was over a considerable portion of it. I went over it in settling up the contractors' claims. They made a claim that the work on the new line was of a different nature—that there was more swamp, and they were further from the means of communication. I had to examine a large portion of the line in order to see in what the difference consisted. The new line is shorter, with better gradients and less quantities.

By the Honorable Mr. Penny :—

Q. What is the approximate cost of the delays the contractors claim for?—There were seven claims. Claim 1 is for fares of men from Sarnia to the landing, and for boarding those men, $3,142. That claim was for boarding and men's wages while idle, and fares for new men to supply the places of those who left.

Q. Is that what we may put down as the cost of delays?—Yes.

By the Honorable Mr. Macpherson :—

Q. Did I understand that that claim arose in consequence of the contract being let before the survey was made, and before it was ready to be let to the contractors?—Yes; they proved that, because I awarded part of their claim; I went thoroughly into the matter and awarded them what I thought was due.

By the Honorable Mr. McLelan :—

Q. Were the rock cuttings made to the full width, according to specification?—The cuttings in both earth and rock were made to the full width. The embankments alone are narrow in places, which fact has arisen from want of foresight on the part of the engineer in not making it large enough at first. If I were wanted to make an embankment 17 feet of clay material, I would allow two or three inches for every foot in height for subsidence.

Q. Have you any idea of the quantities required to make this embankment up to the full height?—There have been no cross sections of the embankments made; some are full width, and some are not over 14 feet. But I did not order more stuff to be put on them, as I thought they were secure enough, and I did not wish to patch up the embankments.

Q. But 23 cents is a low price for earth, and you cannot get them up for less than that?—There was a great difficulty in getting earth at all in some places, the country abounds in low swamp and peat; you have to go for miles in order to get sound earth in some places.

Q. Whose fault is it that the embankments were not sufficiently made up?—There is a reason given in the report I made to the Government, that this earth is of so spongey a nature that it would take at least two yards of such material to make one yard of embankment, which, although the contract price was low, would bring it up to 42 cents per yard. Instead of doing that I recommended the Government to make up the deficiency with ballast on the score of economy.

By the Honorable Mr. Scott :—

Q. Was there a considerable reduction made in the crib work subsequent to the original estimate?—In giving my evidence before the Public Accounts Committee, I stated that I believed that there are a number of items that have been reduced, amounting to a total of about $50,000—works that had been in the original bill of works, that had not been executed. This makes the discrepancy the more remarkable.

Q. If the crib work had been reduced, would not the earth work naturally have been increased?—No; the first line ran along the river side in some places, and the crib work was to protect the embankment from freshets. But the line was taken away further from the river and the reduction of crib work would not necessarily increase the earth work in that case.

By the Honorable Mr. Macpherson :—

Q. The crib work was not necessary when the line was removed from the river?—No; that is the cause of those quantities of crib work having been reduced. The Minister of Public Works was alarmed about the increased cost on this section. Mr. Hazlewood had told him that there would be a reduction of $50,000 by adopting the new line, and from this, I suppose, there must have been a mistake in the original estimate of quantities.

Q. But the increase on the whole was $61,183, instead of a decrease?—Yes.

By the Honorable Mr. McLelan :—

Q. I understood you to say that Mr. Hazlewood represented to the Government that the change of location would make a saving of about $60,000?—There would be a saving, and I have no doubt it would be near that amount.

Q. But in actual working it exceeded $61,000, so that the original estimate would be $121,000?—Yes, there must have been something very wrong in the original estimate. I took every means to ascertain from the measurements of the returns made for the contractors. I could not, of course, say they were perfectly correct, but I believe there was no intention to be incorrect; that the engineers who made them were honest men.

Q. Was Mr. Hazlewood an experienced locating engineer?—I would not like to speak of another man's experience. I know he had been a good while on the Intercolonial Railway.

CONTRACT No. 25.

By the Honorable Mr. Macpherson :—

Q. This contract extends from Sunshine Creek to English River, and embraces grading and bridging for a distance of 80 miles?—Yes; the same contract also embraces the track laying and ballasting from Fort William to English River, a distance of 112½ miles.

By the Honorable Mr. Penny :—

Q. I wish to ask you if the track laying has been accomplished?—Nearly; within ten or twelve miles.

By the Honorable Mr. McLelan :—

Q. Have you the date of the contract?—The contractors are Purcell & Ryan, and I think the date of the contract in Mr. Fleming's report is correct, June 7, 1876.

By the Honorable Mr. Macpherson :—

Q. Was the country through which contract No. 25 extends, thoroughly surveyed and the line properly located before the contract was let?—No; it does not appear to have been so, at least the line has been deviated very considerably since the contract was let.

Q. Who located this part of the line?—It was located under the direction of the late Mr. Hazlewood, who was the District Engineer, and I believe his assistant, Mr. McLennan, located a considerable portion of it.

By the Honorable Mr. Penny :—

Q. Do we understand what you call locating, the trial survey or the final survey?—The final survey.

By the Honorable Mr. Macpherson :—

Q. Were there cross-sections taken so as to ascertain what the quantities were?—Not in the original survey. I had that information from Mr. McLennan, who is here.

Q. There seems to be a great difference in the quantities between the schedules and the work executed?—The solid rock excavation in the original schedule is 260,000 cubic yards; the quantity taken out was 76,800 cubic yards; loose rock, original quantity, 10,000 yards, quantity taken out 110,000 yards; earth excavation, original quantity, 1,000,000 yards, quantity taken out 1,970,000 yards. There was a great variation in all the quantities.

By the Honorable Mr. Scott :—

Q. I would like to know whether there was a profile at the time the contract was given out?—Yes; this is the profile (profile produced), that was exhibited to the contractors.

Q. Who prepared this profile?—It was prepared under the directions of Mr. Hazlewood.

Q. Does it profess to be prepared from actual measurements, or is it all imaginary?—It is to be presumed that it is taken from a survey.

By the Honorable Mr. Macpherson :—

Q. If that were shown to you as a profile, and you were told that you were to lease a tender upon it, you would assume that it was actually measured?—Yes; I have endeavored to make every enquiry to ascertain the cause of the discrepancy, and how the original profile was made. Mr. McLennan tells me that part of it was from a trial line, and part of it from a projected line between two trial lines.

By the Honorable Mr. Scott :—

Q. When this profile was prepared in the Department, was there not a manuscript report sent in with it? Did not the engineer return it with a letter of some kind, setting forth what he had done?—I do not know that he did. The profile was made in the office at Ottawa.

Q. It was made from the original field notes?—I suppose so.

Q. Were they Mr. Hazlewood's field notes?—I do not know; I had nothing at all to do with the work at the time it was let; I was engaged at the time on the other side of the Rocky Mountains. You had better call Mr. McLenan who conducted the surveys, and knows more about it than I do. You will observe that the red line on the profile which shows the formation level, is very near the surface line. It is too low, as there is no part of the line constructed so near the surface as that. It is, in part, a swampy country, and the line is far too low for construction. It is evident, on the face of that profile, that the quantities must have been too small. I do not know who laid them down at all. They were under the direction of Mr. Hazlewood. If it had been done under my directions, I would have laid down the formation line at a higher level.

By the Honorable Mr. Penny:—

Q. Supposing that, knowing nothing about the country, you had seen that profile, would you say, on the face of it, that it is an erroneous profile?—No; what I am speaking of now is from practical knowledge; I have no reason to doubt at all that the profile has been made from notes. The engineer who was in charge of the surveys, has told me that there were surveys made right through.

Q. What I want to get at is this: Supposing you were the gentleman engaged in the Department, and I employed an engineer, and that engineer brings me a profile like the one before us, would I, with any competent knowledge of my business, be presumed to know, on looking at it, that it was an erroneous profile?—No, certainly not. The remark I have made as to the formation line being too low, the quantities taken from this profile would also be low.

By the Honorable Mr. Macpherson:—

Q. What price is charged here for solid rock?—$1.50 per yard.

Q. And for loose rock?—Ninety cents.

Q. And for earth?—Thirty-three cents for the earth in line, and thirty-five cents for earth taken from the ditches.

Q. Are the rates of these items proportionate and reasonable?—According to the experience we have with a number of the contractors, they do not appear to be very consistent. In other words, the price of solid rock would yield little, if any, profit; it would be as much as they could do, to do it for that money. The price for earth at thirty-three cents is very high, and would yield a large profit. The price for loose rock, ninety cents, is also rather high. It consists either of stones or large boulders.

Q. What size is calculated for loose rock?—The loose rock was principally boulders. In the specification loose rock was placed up to forty feet; but I drew Mr. Fleming's attention to it that it was very large, as forty cubic feet of rock could not be removed without blasting.

Q. How do these tenders compare with the prices of the contracts let the other day on the same road?—Marks' tender is on the same sort of country, and Purcell & Ryan's contract joins. I have not got Marks' tender with me, but it is what I call anything at all but a consistent tender.

By the Honorable Mr. Penny:—

Q. Perhaps Mr. Smith would have no objection to tell us what he knows of Mr. Hazlewood's previous services?—All that I know of Mr. Hazlewood is, he was a District engineer on the Intercolonial Railway.

By the Honorable Mr. Scott:—

Q. What was his reputation on the Intercolonial Railway?—I do not know. I never heard anything against him, except about Section 5. There was a good deal of discussion about it.

By the Honorable Mr. Penny:—

Q. Was Mr. Hazlewood, from his position on the Intercolonial Railway, such a person as would naturally be selected for the work he was employed upon here?—He was in the same position on the Intercolonial that I was.

Q. Was it promotion, to begin with?—He was promoted by Mr. Fleming to that district, and Mr. Rowan to the other. There is one thing which I can speak of, without being invidious to anybody. On the Intercolonial Railroad I was in the same position as Mr. Hazlewood, and here I have had charge of this work on the Pacific Railroad as Acting Chief Engineer for two years. It was my duty to see and enquire into the conduct, ability and attention of every officer on the line.

Q. Then you occupied the same position on the Intercolonial Railway as Mr. Hazlewood did?—Yes.

Q. So that there was nothing unnatural in Mr. Hazlewood taking the position on the Pacific Railway that he did?—No; and there is one thing I may remark: This is a different thing from the Intercolonial. On the Intercolonial it was possible for a Chief Engineer to have some personal supervision over the whole line, as it was only four or five hundred miles in length. The Pacific Railway is two thousand miles in length from Lake Superior to the Pacific, and it is utterly impossible for one man to give personal supervision over all that, so that the district engineers that are selected, ought to be men of very high standing and of very large experience. Their office, in fact, is fully as important as that of Chief Engineer, because the Chief Engineer has to depend entirely upon what is reported to him by those officers.

By the Honorable Mr. Macpherson:—

Q. What was the estimated cost of the work upon the Schedule upon which Section 25 was based?—$1,037,061.

Q. What amount was paid up to the date of the latest return?—$1,310,206.

Q. What was the date of the latest return?—November 30th.

Q. What do you estimate it will cost to finish the work?—It is estimated that $74,439 will complete it.

Q. So that the total cost of the work is estimated at?—At $1,384,645.

Q. Being an increase over the estimated amount of how much?—I make it $347,584.

By the Honorable Mr. Scott:—

Q. In forming the estimate of the rock and earth, we should have the original tender?—I understand that this section stands in a different position from the other, inasmuch as the contractors have not yet been settled with. The quantities have been so unsatisfactory, that no settlement could be made with the contractors until it is enquired into, to try and find out the cause of the discrepancy.

By the Honorable Mr. Christie:—

Q. You are not aware of the cause yet?—No; we cannot tell as measurements have not been made.

By the Honorable Mr. Macpherson:—

Q. Have you any reason to believe the measurements have been inaccurate?—I have some reason to believe that the original quantities were erroneous. The profile was, I understand, made in the head office here by assistants, without any knowledge of the ground. Some of the surveys were made in frosty weather by the engineers when the ground was hard, so that they did not know the nature of it. I am very anxious not to speak of any of my colleagues unjustly, but I have had reason to complain. I pointed out the nature of this work, and I complained to Mr. Hazlewood and his assistants that they had not in some cases given the personal supervision to the work that they ought to have done. I wrote him a letter instructing him that every piece of work that was done, the Division Engineer must have supervision of it, and the return of quantities must not only be his, but he must go along with each assistant in making final measurements and return them, not only with his own certificate, but that of his assistants. I found that there had not been that supervision I have been accustomed to give to my own work. Mr. Hazlewood had been in poor health for the last two years previous to his death, and that may have accounted for it. It was the same way with Mr. Rowan's district at the other end of the line.

Q. Have the contractors put in any claim not in the schedule?—No, they have put in a claim for the drawback of ten per cent. reserved on each month's certificate. They have been paid a considerable portion of it; but there is still a balance of some $50,000 of the drawback, payment of which has been refused, until the discrepancy between the original estimate of quantities and the last returns is investigated.

Q. Have they not put in a claim for a large amount of something that does not appear in the schedule at all?—I have not heard so. There was no claim made to me up to the time of Mr. Fleming's return in November. Since his return it may have been made without my knowledge, as when he returned from England he, of course, took my position.

By the Honorable Mr. McLelan:—

Q. I notice that the length of the line has not increased?—No, not at all.

Q. But I see the ballasting of it exceeds the estimate by nearly $47,000. How is that?—There was more ballast put in the road than was originally estimated. It was estimated that the embankment would be fully formed; that after being consolidated they would be the full size, and it was estimated to put on half ballast with one lift of the rails. In some cases the embankment had shrunk and we had to raise it with ballast. In other cases the full ballast has been put on instead of half ballast. The bridges and culverts were all put on the full height, whereas the ballast that was estimated to be put on in the contract did not raise the rails to within some eight inches of that height, so that in coming to bridges we have put in the full ballast. Where the incline is very steep, or grades of one in one hundred, the ballast has to be put in the whole length of the grade.

Q. The ties exceed the estimate by 8,000?—They may have put in more sidings, or may have laid them closer together.

By the Honorable Mr. Macpherson:—

Q. How is the width of the embankment in this section?—They would not average more than fourteen feet. I, first of all, went over them in 1877, for a portion of the line. I saw then that the embankments were being made too narrow, and the excuse given was that they were aware of it, but they were making them narrow so as to be able to get the engines over to some heavy works, and they would widen the embankment after. I went over the line again in July or August, 1878. I still found the embankments too narrow; those that the contractors had not made up, and pointed it out to them. Some of them that were clay embankments I reported to the Government, recommending that they should be made up with ballast, because the slopes would stand so much steeper, there would be so large a saving in quantity, that it would be more economical to do it in that way.

By the Honorable Mr. McLelan:—

Q. In the item "work executed," I see a charge for widening embankment, $31,578. Does that refer to Section 25 or 13?—It may apply to both contracts. The ballasting included both those sections. It will apply principally to Section 25. There is only one place in Section 13 that I ordered the banks to be widened by Purcell & Ryan, but they had to put more ballast on to bring the rail up to the proper level.

Q. That estimate of 80,000 yards to widen the embankment is applied only to Section 25?—Yes, chiefly to that section. I will explain, however, that after the contractors for Section 13 had completed the work, there was still some subsidence going on in the embankments.

Q. But you estimated that wholly on 25?—Yes.

Q. How many yards for that?—Eighty thousand.

Q. That, properly, should be added to the earthwork—to the 1,070,000 yards? Yes, it ought to be.

Q. That would be more costly than ordinary earthwork?—It would depend on where they took it from. It is put down at ballast price in accordance with the

recommendation I made to the Government, that though the ballast had to be hauled 10 or 12 miles, and the rates were higher, the quantity required would be so much less that it would be more economical.

Q. Then, by adding that to the earthwork already done, it would make the total 2,070,600?—Yes, about that.

By the Honorable Mr. Christie:—

Q. What would be the difference in cost between ballasting and finishing with earthwork?—It would require 50 per cent. more of clay than of ballast to make up the embankments, and I recommended the ballast.

By the Honorable Mr. McLelan:—

Q. In that charge of 80,000 yards for widening the embankment, how much of it belonged to Section 25?—I think, it would nearly all belong to Section 25.

By the Honorable Mr. Macpherson:—

Q. That should be added to the 1,970,000 yards of earth?—Yes.

Q. Were the embankments as wide as they should be under the specification?—After they were consolidated they were not. The additional work would bring the total of earth up to 2,133,702 yards. I will give you the quantities. There are 1,970,000 yards returned as executed; widening of banks, which ought to have been added to that, 83,102 yards; still to be done, 80,600 yards. These three quantities added together will be the total of earthwork when the embankments are completed.

By the Honorable Mr. Scott:—

Q. Was ballasting included in that contract?—Yes.

By the Honorable Mr. Macpherson:—

Q. The estimated quantity of ballast was 180,000 yards. There has been 198,898 yards executed. Then there is a further quantity estimated as required to be executed of 100,227 yards?—Yes, that makes a total of 299,125 yards. I can account for some of that excess. Some of it was for making up embankments on Section 13, where they had subsided.

By the Honorable Mr. Scott:—

Q. It is not all on Section 25?—No; the contract for ballasting covers both sections. A small portion of that excess is due to Section 13, and the other part is due to Section 25. It occurs generally from the embankments having subsided and having to be made up with ballast, and in other cases in raising the grade up to bridges.

By the Honorable Mr. Macpherson:—

Q. The original estimate applied to both sections?—Yes.

By the Honorable Mr. Scott:—

Q. Has there been more ballast than was originally intended?—Yes; nearly double, but a good deal of that arose from the embankments having been made too small. The proper allowances have not been made for subsidence and shrinkage. I can account for the increase in ballasting, but I cannot account for the increase of earth.

Q. What was the character of the ground on Section 13?—There was some peat ground—not a large proportion—and some rock. On Section 25 there was a larger proportion of muskeg or morrass.

Q. What was the character of the earth excavation?—Some of it was clay, some of it of a sandy nature, some rock and some boulders—nothing specially difficult about it.

THE SENATE COMMITTEE ROOM,
Thursday, 3rd April, 1879.

SECTION 14.

Mr. MARCUS SMITH recalled and further examined.

By the Honorable Mr. Macpherson :—

Q. I see by the schedule for Section 14 that that contract extends from Cross Lake to Selkirk, on the Red River, 77 miles ?—Yes.

Q. What was the cost of the work, according to the estimate on which the contract was based ?—$402,950.

Q. What was the cost of the work executed up to the date of the latest returns ?—$658,849.

Q. What was the date of that return ?—28th February, 1879.

Q. What amount is estimated as being necessary to complete the work ?—$63,285; The total cost of the work will be $723,134.

Q. Is the Committee to understand you to say that the work, according to the schedule on which the contract was based was to cost $402,950, while the actual cost of completing it will be $723,134 ?—Yes.

Q. How do you account for the increase ?—I can account for some of it—for the portion where it joins Mr. Whitehead's contract, the gradient of Section 14 had to be raised to meet the gradient on Mr. Whitehead's contract, which was much higher. Contract 14 was let before Section 15, and it stopped at Cross Lake; consequently the gradient was laid down up to that point, but after Section 15 was let, it was found that we could not get down to that point with a good gradient, so we had to lift the gradient of 14, in order to meet that of 15. It made the embankment considerably higher for probably a mile back. It made a large difference, as it raised the height of some embankments to 50 feet.

By the Honorable Mr. Haythorne :—

Q. You had to make an artificial incline ?—Yes; and that made the embankment very high, and threw the line into some heavy rock cutting that increased the cost, as we had to change the location.

By the Honorable Mr. Macpherson :—

Q. Was not the country surveyed before the contract was let ?—I do not know that there had been a survey, right through from Rat Portage to Red River before the contract was let. I cannot answer that question positively.

Q. The raising of the grade at the junction of the contracts would only account for a small portion of the increased cost ?—I do not suppose it made a difference of over twenty or thirty thousand dollars.

Q. If the line had been properly surveyed, there would have been no break of that kind ?—If the country had been thoroughly surveyed before that, there would have been no break. The survey was imperfect; a rough preliminary survey.

Q. What was the quantity of solid rock work in that contract, according to the original estimate ?—10,000 yards.

Q. How much has been executed ?—34,442 yards.

Q. What was the original estimate for loose rock ?—3,000 yards.

Q. How much has been executed ?—36,720 yards.

Q. What was the original estimate for earth excavation ?—The original estimate for earth was one million yards.

Q. How much has been executed ?—1,554,431 cubic yards.

Q. What are the other leading items ?—These are the principal items in which the difference arises. There is some discrepancy in that schedule with regard to off-take drains. The quantity I gave you did not include off-take drains at all. There is, besides the earth embankment, excavation for off-take drains, the original estimate for which was 40,000 yards, and the quantity executed was 87,163 yards.

Q. The earth excavation under water—What was the original estimate?—That is for foundations; it is a small item. There was nothing in the original estimate for that, but there has been executed 3,378 yards.

Q. What was the original estimate for pile-driving?—The original estimate was 2,400 lineal feet of piles at a cost of $1,200. There were executed 25,173 lineal feet at a cost of $12,586.

Q. What is the estimate of the cost of timber in the schedule?—The estimate of the cost of square timber was $26,350, and the actual amount done is $15,533.

Q. What is the contract rate for solid rock?—$2 a yard.

Q. And for loose rock?—$1.

Q. And for earth?—Twenty-six cents—that is for the earth in the railway; earth in off-take ditches, twenty-three cents.

Q. Was not the rate for rock cutting very high?—No, I do not think the rock was very high there. It was lower than the other contracts considerably. It was higher than what late contracts have been let at, but at that time it was not considered high.

Q. Do you consider those prices consistent with one another?—Yes, I think the contractor would have a reasonable profit on every item, and it did not make much difference what items were changed.

Q. Can you give an idea of the cause of the increase of cost?—I have no facts to show the cause, but I can give my opinion.

By the Honorable Mr. Penny:—

Q. The whole of the increased cost, with trifling exceptions, is to be found in these items?—I do not know from actual measurement the cost of the increased quantities, but if you will allow me to give an opinion, I believe the original quantities were far too low; that they were estimated in the office at Ottawa without due allowance being made for subsidence and shrinkage. There is a great deal of swamp ground in that section. It is worse than what we call muskeg, in which you can put down a pole for over 20 feet or more, in some places. If the quantities were simply taken from the profile, it is quite evident that the embankment would not be more than two feet high, but the embankment went down several feet in the soft mud, and it required a great deal more earth to cross such places than what appears from the profile. I may tell you, that I questioned Mr. Rowan about this, when I saw the quantities were exceeding the estimates so much. I asked him to account for it. He told me he did not get out the original quantities himself. I said you have charge of the district though. He said "Yes, but this matter was taken out of my hands, and the quantities were prepared by somebody else." It is quite evident that the person who got out the quantities was not acquainted with the surveys, and had no knowledge of the ground. That is the only way I can account for the discrepancies.

Q. If a proper survey had been made by an experienced engineer, would any such discrepancy as this have arisen?—Not so great; in difficult places like that, there will be always some discrepancy in the measurements, but nothing like that. In that kind of country it is not possible for any engineer to make so close an approximation to the true quantities as he would where the ground is more solid; but still, an experienced engineer who has had work to do under similar circumstances, would be able to make a close approximation; there would not be anything like the discrepancy that exists here.

Q. His estimate might have exceeded the work executed?—Yes, it might have exceeded the actual amount; I may say that the estimates for the last contracts I superintended myself, and I had to make such a large allowance for subsidence and shrinkage, and the work will probable be done for less than the estimate. On going over Contract 14 I made every inquiry to try and arrive at the cause of the discrepancy in quantities. The work was nearly completed and the contractors had to be settled with, I was very anxious to find out the cause of this increase, and see that no improper returns of work were made. After all the inquiry I could make, I came to the conclusion that the engineers engaged on that section had made their measure-

ments honestly and with great care; that they were correct, and that the cause of the increase was the imperfect surveys before the contract was let.

By the Honorable Mr. Cornwall :—

Q. Is it a fact that the surveys were made at a time when the ground was covered with snow?—So Mr. Rowan says, and if that were the case, he would not be able to distinguish muskegs from solid earth.

By the Honorable Mr. Macpherson :—

Q. Should there not have been platforms or corduroy put in these soft places?—In discussing that question with Mr. Rowan, I said when you saw that these embankments were swallowing up so much more earth than was originally estimated, why did you not think of suggesting some means by which the subsidence could be arrested. He said he was carrying out the original plan, and that the deepening of the off-take ditches would be sufficient under the circumstances. I replied that I would have corduroyed it with timber.

By the Honorable Mr. Scott :—

Q. What size of timber?—Any kind of timber from six inches upwards. In the late contracts that were let, I have put in a very large quantity of this platform of round timber, and I believe a very great saving in cost will be effected by it. I know for every dollar spent on platform work, there may be a saving of three dollars in earthwork. Of course, Mr. Rowan could not undertake to alter the plans of the works of his own accord, although he has charge of the district, but he had only to make a report, and present a plan of it to the Chief Engineer and receive his approval.

By the Honorable Mr. Haythorne :—

Q. He did suggest a plan in one instance, in the case of the Julius Muskeg, between Station 1,838 and Station 2,069. He suggested the draining of that muskeg, which was done?—Yes; and these deep ditches have largely increased the earth excavation; but if he had put in corduroy work he would have largely decreased it. That drainage has worked some good for the country, however; it has drained the land on each side of the Railway.

By the Honorable Mr. Macpherson :—

Q. Please tell us how Selkirk came to be fixed for the railway crossing at Red River?—I cannot say; I had nothing to do with it.

Q. Do you know if the survey was commenced at Selkirk and extended eastward, or was it commenced at Rat Portage and extended westward?—I do not know the way the survey was made, except from the numbers of the stations on the profiles. My impression is, that there was a rough trial line run through from Rat Portage to Selkirk, but the contract was let on the west end, before it was at the east.

Q. Was the contract let on Section 14 before the survey was completed on Section 15?—Yes, except the rough preliminary survey. As far as I can make out, there was a preliminary survey made from Rat Portage to Red River. Section 14 is the western portion of that survey, and the contract was let on the preliminary survey before the location survey was made for Section 15.

Q. Do you know anything of the country west of Red River where the line is located?—I have not been very much on the line, but I have made a great many enquiries about it, from the different engineers who made the surveys.

Q. Were the surveys made in the winter time?—I believe so. It is a very low country with a great deal of wet ground.

Q. Is there is a great deal of muskeg?—According to the explanations given to me, the muskegs are not very deep in that direction; still it is a muskeg country.

By the Honorable Mr. Carrall :—

Permission of the Committee is allowed to ask the following questions :—

Q. You have been asked if the surveys were made in the winter. I have heard that they were made in the winter, and that it is a muskeg country. In one case I have been told that, where depots were built for supplies, when the spring came and the ice melted they sunk through out of sight?—For surveys in a vast country winter is the best time to make them. But to get proper information the Engineers had to break through the ice and take the soundings of those muskegs with poles.

By the Honorable Mr. Haythorne :—

Q. Can you not discriminate from the appearance of the timber and the plants growing over it whether the ground is muskeg or not?—Yes. Experienced persons find that in the deep muskegs no trees can grow, and where it is not so deep the growth is unhealthy-looking spruce and pine, without any large trees.

By the Honorable Mr. McLelan :—

Q. Are these prices in the original tender for Section 14 consistent?—Yes, I think so, on that contract. I think they are so far consistent that it did not matter to the contractors what changes were made in the work.

Q. But you do not consider the tender for Section 15 is consistent?—The prices are certainly far from being consistent.

Q. On what terms?—For solid rock excavation, $2.75 is a high price; and for loose rock excavation, $1.75 is very high. Earth excavation at 37c. is also a high price.

Q. What do you say to the prices for timber?—They are low priced.

Q. Then as to tunnelling?—The tunnelling is a low price. The contractor will lose money by the tunnelling.

Q. Could it only be done at a great loss under that contract?—I presume so, from the price being so excessively low.

Q. Can the wood work be done except at a loss?—It is so low. I suppose it can only be done at a loss.

Q. I believe the wood work has been largely abandoned?—Yes.

Q. What is the original specification for tunnelling; and what has been executed; and what is the proportion to be executed?—The line tunnelling in the original was 425 feet.

Q. How much is it proposed to have executed?—376 feet is estimated to be the length when completed.

Q. That has been lessened 49 feet?—Yes.

By the Honorable Mr. Scott :—

Q. What is the rate estimated for tunnelling?—Thirty dollars per lineal foot—two dollars per cubic yard.

Q. What was the estimate for the 20 feet tunnel?—The original estimate was 200 feet.

Q. Was that all put in?—It has not all been put in.

Q. Is it intended by your estimate here to put it all in?—It is still estimated that the 200 feet will be required.

Q. And the 16 feet tunnel: how much was estimated as being required?—One hundred and sixty feet.

Q. Is it proposed to put that all in?—It does not appear in the marks estimated to complete the section.

Q. Then it has been left out?—Yes; I suppose so.

Q. What is the original estimate for twelve feet tunnel?—Three hundred and twenty feet.

Q. How much is proposed to be put in?—Two hundred feet.

Q. That is a reduction of 120 feet?—Yes.

Q. What was the estimate for eight feet tunnels?—450 feet is estimated in the original bill. It is now estimated that it will require 520 feet—an increase of seventy feet.

By the Honorable Mr. Scott :—

Q. What is the rate for that?—Nine dollars per lineal foot.

By the Honorable Mr. McLelan :—

Q. What was the original estimate for six feet tunnels?—It was originally estimated at 1,300 feet.

Q. How many cubic yards to the running foot?—One cubic yard.

Q. What is the rate?—Seven dollars.

By the Honorable Mr. Scott :—

Q. What quantity has actually been executed?—None, I think; but it is estimated that it will require 1,460 feet. The original estimate will be exceeded by 160 feet.

By the Honorable Mr. Macpherson : —

Q. How is that rate?—There is not so great a discrepancy there; it is seven dollars a yard there, and only two dollars for the large tunnel.

Q. Then in the large tunnels, with the low prices, the quantities have been reduced?—The large tunnel—that is the line tunnel—has been reduced 49 feet. It is estimated to be reduced, but it has not been completed yet.

By the Honorable Mr. Scott :—

Q. What is the price for that?—$30 per lineal foot, or $2 for cubic yard.

By the Honorable Mr. McLelan :—

Q. That is less than for open rock cutting?—Yes.

Q. And the 16 feet tunnels—it is proposed to leave out altogether 160 feet?—They are left out in the estimate.

Q. They have eight cubic yards to the lineal foot, at $18 a foot?—Yes. That is a low price. It is only $2.25 per cubic yard; it is less than the price for the open cutting.

Q. The 12 feet tunnel is 4 cubic yards to the lineal foot, at $14 per lineal foot is equal to $3.50 per cubic yard. That quantity has also been reduced?—Yes.

Q. And the small tunnels have been increased?—Yes.

Q. We have gone through Sections 13, 25, 15 and 14. Will you be good enough to give us the original estimate for Section 13, as we have to repeat them. What does Mr. Fleming estimate the line at, as shortened?—$270,796—that is from Fort William to Sunshine Creek.

Q. What was the estimate for Section 25?—$1,037,061.

Q. How much was estimated for Section 15?—$1,594,085.

Q. How much for Section 14?—$402,950.

Q. What does the estimate of the whole four Sections amount to?—$3,304,892.

Q. And the small tunnels have been increased?—Yes.

Q. We have gone through Sections 13, 25, 15 and 14. Will you be good enough to give us the original estimate for Section 13, as we have to repeat them. What does Mr. Fleming estimate the line at as shortened?—$270,796—that is from Fort William to Sunshine Creek.

Q. What was the estimate for Section 25?—$1,037,061.

Q. How much was estimated for Section 15?—$1,594,085.

Q. How much for Section 14?—$402,950.

Q. What does the estimate of the whole four sections amount to?—$3,304,892.

Q. What have the four sections cost already. What is it estimated it will cost to complete them?—$4,963,758 will be the total cost.

Q. What has been the increased cost?—It has been an increase of $1,658,866 over the original estimate—nearly 50 per cent.

By the Honorable Mr. Macpherson :—

Q. And you look for further expenditure on Section 15?—I walked over the whole of the line with Mr. Whitehead, and Mr. Rowan and other engineers, and I found that even at that time they had not sufficient information, to make a close estimate of the amount required to finish the contract. There are several difficult

points at lakes they had to cross, on which they had no other information than what was obtained by taking soundings of the water with poles. This gives very uncertain data to make an estimate upon. The very next place we came to, I found they were making rock embankments that were sinking, day by day, several feet; I immediately telegraphed for a set of boring tools, which have been sent out there, and they are at work with them now to ascertain the nature of the ground under water.

By the Honorable Mr. Macpherson:—

Q. Is it your opinion that these contracts were let before sufficient information had been obtained?—I think the evidence will show that they were let, on very insufficient information.

Q. And that even the change at Contract 15 was made on very insufficient information?—Insufficient information in a different way. Better surveys were made, but the information in lake soundings was not sufficient.

By the Honorable Mr. McLelan:—

Q. I understood that the increased cost has been fifty per cent.?—Yes.

Q. Is this usual in the construction of railways?—No; it sometimes happens, but I should not like to be the engineer that it happened with. It ought to go much closer than this to the estimate.

Q. Is it an exceptional case?—Yes; in fact, we made estimates on the Intercolonial Railway that were absolutely binding, and had to be carried out, and in most cases, the quantities executed were under the estimate.

By the Honorable Mr. Macpherson:—

Q. Is it not a fact, that where surveys are properly made, there should be little or no difference between the estimate and the amount executed?—There should be very little difference.

By the Honorable Mr. Penny:—

Q. A knowledge of the country would not change this?—If the contractors had a fair bill of works before them, they might have made considerable difference in their prices.

The Senate Committee Room,
Tuesday, 1st April, 1879.

Committee met this day.

Section No. 15.

Mr. Marcus Smith recalled and examined.

By the Honorable Mr. Macpherson:—

Q. Is that the schedule of work on Section 15, showing the estimates on which the contract was based? (schedule produced and fyled as Exhibit C)—Yes, these are the original quantities on which the contract was based; and the second column gives the amounts executed.

Q. What was the amount on which the contract was based?—$1,594,085.

Q. To what extent has the work been executed?—Work has been executed to the amount of $1,279,972.

Q. What amount is estimated as necessary to complete the work?—$1,245,027.

Q. Making the total cost of the work how much?—$2,525,000.

Q. How much more than the original estimate is that?—I make it $930,915.

Q. How do you account for the great increase of cost?—By a change in the character of the works. As the contract was let, a large quantity of trestle work was to be used instead of embankments, to cross ravines and depressions in the ground.

Q. Is that trestle work described in the schedule?—Yes; the details of it are there.

Q. Were new tenders invited when this great change took place in the work?—No.

By the Honorable Mr. Christie:—

Q. Is it usual to call for new tenders when changes are made in the works under contract?—I never knew changes of such magnitude being made without tenders being called for. It is a total change in the character of the work, you must understand.

By the Honorable Mr. Macpherson:—

Q. On whose authority was the change made?—It appears to have been made under the authority of the Engineer-in-Chief, Mr. Fleming, based on a report of Mr. Rowan, the District Engineer.

Q. Have you got that report here?—Yes (report produced). It is dated May 22nd, 1878. It shows the comparative cost of completing the embankments with earth and making them permanent, or bridging the ravines with trestle work. It appears to have been submitted to Mr. Fleming. I may say I knew that such a report was being made, but I never saw it; and the first I knew of the change was in going over the line last summer. I then found that they were completing the embankments with earth work instead of trestle work. I asked on whose authority they were doing it, and they said on the authority of Mr. Fleming. I telegraphed to Ottawa for a copy of Mr. Fleming's letter, authorizing this change, which I have here. It is addressed to F. Braun, Secretary of the Department of Public Works.

(Letter fyled. Exhibit D.)

By the Honorable Mr. Penny:—

Q. Do I understand that the $360,000 referred to in that letter was to be gained on trestle work, by the expenditure of $260,000 on earth work?—It would read that way, but I suppose the substitution of earth work for trestle work would be that much more.

By the Honorable Mr. Macpherson:—

Q. Do you know what further action took place upon this?—When I got that letter I instructed them to go on with the work accordingly, as I presumed it had been approved by the Government.

Q. When were you there?—I was there in August, last year. I walked over the line.

Q. Did you find they were going on under this change?—Yes; they were.

Q. Do you know what action took place in Ottawa in the Department of Public Works?—I do not know at all.

Q. Surely a change involving such a large amount would not be made on the stroke of the pen of the Engineer alone?—I had no instructions from the Department when I left there. I was not even informed of the change; but, when I got to the section, Mr. Rowan said he had been instructed to go on in that way by Mr. Fleming.

Q. You are not aware of any action upon it in the Public Works, or whether an Order-in-Council was passed?—I am not aware of it. I had no means of communicating with the Government. By the time I got to Winnipeg it was after the elections, and I did not know whom to communicate with.

Q. What do you understand to have been Mr. Rowan's estimate of the increased cost involved in the change?—That estimate could not account for it.

Q. What do you understand to have been his estimate of the cost of the works involved in the change?—He says $260,000.

By the Honorable Mr. Christie:—

Q. Do you understand that to be added to the original estimate?—Yes. He says the cost of completing the embankment with earth instead of trestle work will be $550,500; deduct trestle work done away with, would leave a balance of $188,500;

to which if masonry is added, it will make $258,500. I may state, however, that when I discussed the matter with him, I found out that this estimate did not cover the whole thing; that there had been changes in the gradients—the gradients had been lowered, which made a great deal more rock cutting.

Q. What was the object of lowering the gradients?—It was to reduce the cost of crossing ravines and deep depressions as much as much as possible, and to get material and more nearly balance the quantities of excavation and embankment.

Q. What was the effect of lowering the grade?—The effect would appear to be an increase of the total cost by some $900,000; but the practical effect was to increase the rock work and reduce the earth work so much more.

Q. You mean the trestle work?—No, the earth work—a small increase in rock work, but a very large decrease in earth work. Mr. Rowan has not apparently taken that into account in his estimate of the difference of cost, because we find that instead of there being only $258,000 extra cost, it has increased to $930,000.

By the Honorable Mr. Scott:—

Q. Do you approve of the change as being a wise and prudent one?—It depends upon which way you view it. There is no doubt it makes a better railway, but it will cost more.

Q. But, taking all the circumstances into consideration, do you concur in tha view Mr. Fleming expresses in that letter?—Not at the time it was written. If he had written that before the contract was let at all, I would.

Q. Take the circumstances as they were—putting yourself in Mr. Fleming's place—recollecting that the experience of the past few years had proved that bush fires are much more frequent in that country than there was reason to anticipate, and recollecting, also, that this railway is to be a permanent national structure, would you concur in the view of Mr. Fleming, or would you be disposed to take any other course?—I have not given it sufficient consideration to say what I should do. It depends upon the policy of the Government. There are two ways of getting a railway through a country like that: one is to construct a permanent road with permanent works that would take a long time to complete, and the other is to run a road through as quickly as possible with temporary works, to be substituted with permanent works subsequently.

Q. I submit the subject for your opinion. How would you advise the Minister? Would you advise him to go on and construct that road with trestle work?—I have not given the subject sufficient consideration.

Q. That is evading the question?—It is not evading the question. I would not have advised under the circumstances, and I will give you the reason: It is not of the same character as the works on the rest of the railway. If I had advised it I would have advised a new contract to be let.

Q. How could you take it out of Mr. Whitehead's hands if he was willing to go on with the work and the change was required?—This is a very radical change.

By the Honorable Mr. Haythorne:—

Q. Was not the contract for bridges on the Intercolonial Railway changed—iron and stone substituted for wood?—Yes, the bridges were changed from wood to iron; but the abutments were of stone in the original designs. We had all this information before the contract was let for the trestle work and it was changed on the recommendation of Mr. Whitehead.

By the Honorable Mr. Scott:—

Q. Mr. Whitehead does not recommend, he simply proposes it?—I withdraw the word "recommendation" and say the change was made on the "proposition" of the contractor.

By the Honorable Mr. Macpherson:—

Q. How do you account for the difference between Mr. Rowan's estimate and the estimate that is now made of the cost of completing the work—$930,000?—The only way that I can account for it is the change of gradients. The gradients had

been lowered, and it reduced the cost of the embankments but increased the cost of rock work, therefore Mr. Rowan's report may be fair as far as it goes, but it does not include the whole case.

Q. Should Mr. Rowan have forseen that in making his estimate?—He ought to have seen it, of course. When a man makes an estimate for such a change as that he should take every circumstance into consideration.

Q. Did those changes you speak of necessarily follow the other changes that were recommended?—I think so. It brought the balance of cuttings and embankments more nearly together by lowering the formation level.

Q. Should Mr. Rowan have forseen that the additional cost involved in the changes which he proposed, would amount to $930,000 instead of the $260,000 that he reported to the Chief Engineer?—It depends upon what data those changes were made. The changes of grade may have been made before he prepared his estimate, and his report may not have included them. I know so little about the change that I cannot say.

Q. Those changes must have been made after the contract was let?—Yes.

By the Honorable Mr. Haythorne:—

Q. Where did Mr. Whitehead suppose he would get the stuff to make up his embankments?—It is a long history and it would take some time to explain it. There has been two or three bills of works made in connection with this contract. There was a bill of works made in 1875 and advertised. It was very much similar to the work that is being done now. As far as I can learn, one cause of the change was, there was not sufficient timber of a proper quality to be found in the vicinity for trestle work across the ravines. When the contract was let it was supposed there was no earth to be had to fill up those places. Subsequently as I have been informed by Mr. Rowan, they discovered there was sufficient material at different points to fill up those ravines with solid embankment. There was timber, but not close by, and it involved a haul of several miles in some cases. That is the reason why Mr. Whitehead proposed to fill some of them up with earth and not make any charge for the extra haul.

By the Honorable Mr. Haythorne:—

Q. The lowering of the grades was a subsequent operation altogether?—It was found he had material enough to fill up those breaks, but to explain the necessity for lowering the grades, is an engineering question that would take some time to go into.

Q. Was the lowering of the gradients a subsequent operation, independent of the substitution of earth embankments for trestle work?—I don't know; I doubt whether there was sufficient material to fill up the spaces without it. Although the lowering of the gradients increased the rock cuttings considerably, it made a large decrease in the earth work, and brought the balance nearer. For instance, by increasing the rock cutting five yards at $2.50 per yard would be $12.75. If you could decrease the earth work fifty yards by doing that it would be economy to lower the grade, as the increase in rock cutting would not amount to so much as the decrease in earth work. But with trestle work it would make very little difference, as it does not spread out at the bottom like earth.

By the Honorable Mr. Penny:—

Q. What I understand you to say is this:—That the grade was lowered, and it increased the rock work slightly?—Yes, it increased the rock work slightly, but largely decreased the earth work, so that it was advisable to change the grade.

Q. But it would not have been advisable to change the grade if the trestle work had been carried out?—I think not.

By the Honorable Mr. Macpherson:—

Q. I see that both the earth work and rock cuttings have greatly increased over the estimate?—Yes.

By the Honorable Mr. Scott :—

Q. But the increase caused by the substitution of earth work for trestle work more than exceeds the diminution of earth work in embankments caused by change of grade, so that the gross amount of earth work is greater than was estimated ?—Yes.

By the Honorable Mr. Macpherson :—

Q. The original estimate was 300,000 yards of rock work, the quantity executed up to the 25th February was 342,376; of loose rock the original estimate was 30,000 yards; quantity executed 52,500 yards. The original estimate of earth work was only 80,000 yards and the quantity excavated up to 28th February was 224,206 yards —nearly three times the amount estimated. You will see that both rock work, loose rock, and earth work have all increased ?—I think I can see where the difficulty arises. When I speak of the lowering the gradients increasing the rock work and decreasing the earth work, it means that it would affect the new estimate for solid embankments in that way, but as compared with the estimate on which the contract was let, there would be a great increase in rock and earth. It was found that the grades as they stood then—made for trestle work—would have an enormous excess of earth, and it would be more economical to lower the grade on the new plan of doing the work—in other words the grade for solid work would have to be lower than the grade for trestle work.

Q. Is the report which you have produced, from Mr. Rowan, the only report in the Department recommending the change ?—That is all I know of in the office.

Q. Are the Committee to understand that this report, representing an increased cost of $260,000, is all that had been made to the Department, while the actual increased cost is now estimated at one million dollars in round figures ?—It is all I know of. These are all the documents that I have seen relating to the affair.

Q. Did I understand you to say that there was not sufficient timber in the country to carry out the trestle work on speculation ?—Not of the right kind.

Q. Had they not surveyed the country previous to the letting of the contract ?—Yes.

Q. Should they not have known what timber was available ?—Yes; Mr. Carre, assistant engineer on the contract told me he had reported to Mr. Rowan verbally that there was not sufficient timber of the right quality. He reported the nature of the timber—he did not say it was suitable or not, it was for Mr. Rowan to judge.

By the Honorable Mr. McLelan :—

Q. Was that before or after the letting of the contract ?—It was before.

By the Honorable Mr. Macpherson :—

Q. The red line is the new one, I suppose ?—It is the one on which the work is being constructed now. I may say with regard to this estimate of $2,525,000 to complete the road, that it was made last summer. When I was out there last September, I instructed Mr. Rowan to make a very close estimate of the works executed, and required to finish at the end of the year, and to have that report sent to me here by the first of February. That report has not yet arrived. Secondly, this estimate may be closed only approximate. It may be over or under. As the works advance further we may be able to estimate closer.

Q. Is that estimate made up here in the office ?—From records at the Winnipeg office.

By the Honorable Mr. Scott :—

Q. This was made simply for the purpose of paying the contractor ?—No; it was made last year. I expected a later report of that which would approximate more closely, so that any difference could be accounted for.

By the Honorable Mr. Macpherson :—

Q. Where do you say that the estimate showing an increase of a million dollars was prepared ?—I do not know where this sheet was actually prepared, but it was made up from information supplied by Mr. Rowan.

Q. I understood you to say that Mr. Rowan had prepared that estimate, and I want to know whether I was correct?—I suppose it was Mr. Rowan who furnished all the information to prepare it.

By the Honorable Mr. Scott :—

Q. There is one question that I would like to ask with respect to the depression of the road bed. Does it improve the road?—It makes no difference.

Q. Is it not an improvement to the road?—No.

Q. Surely taking out the rise must be an improvement?—The grades are so little changed that, in some places, it will slightly increase the gradient, and at others will decrease it. At one place there is a slight advantage gained.

By the Honorable Mr. Macpherson :—

Q. What is the grade?—About twenty to twenty-two feet per mile where this change was made. I may say that, in making those changes, care was taken that we should not make the road any worse than it was, but I do not know whether it improved it much.

By the Honorable Mr. McLelan :—

Q. You have more cuttings and less embankments?—Yes.

Q. In winter, is not that an injury?—It is a rock cutting, and, for snow, I suppose it is worse. In a cutting that is four feet deep, if you lower it to eight or ten feet it makes very little difference so far as snow is concerned.

Q. But the longer it is, the more of it you will have?—Of course, it is not so good to have a cutting long or deep. It is an improvement to a line to keep as near the surface as possible; so that, in answer to your question, I may say it is a disadvantage in that respect.

By the Honorable Mr. Macpherson :—

Q. What is the length of this section?—Thirty-six and a-half miles.

By the Honorable Mr. Scott :—

Q. When is it to be finished?—I cannot answer that. I walked over the whole of that contract with Mr. Whitehead last August. We discussed every point and the time it would take to finish it. I must say that I never met a man with more energy than Mr. Whitehead; but contractors very often overrate what they can do, and I see no reason for saying that the contract will be finished sooner than a year beyond the contract time.

By the Honorable Mr. Macpherson :—

Q. Will the change prolong the time or shorten it?—It will prolong it at least a year.

Q. Do you think the rates placed upon the various items of work consistent and reasonable in that contract?—I do not think so from my experience.

Q. Wherein are they not so? In some items the rates are very high, and others are so low that they will hardly pay for the material. The rate for timber will hardly pay for getting it out of the woods.

Q. In what did the principal increases occur?—In rock and earth chiefly.

Q. What is the rate for rock?—The rock is $2.75 per cubic yard, solid rock.

Q. And for loose rock?—$1.75 per cubic yard.

By the Honorable Mr. Scott :—

Q. What is the character of the rock?—I do not know what geologists call it. It is granitic or gneissoid.

Q. It is not stratified?—Except so far as the gneiss is concerned. It is all chrystalline rock; igneous rock I think they call it

By the Honorable Mr. Macpherson :—

Q. How much is the earthwork?—Thirty-seven cents per cubic yard.

Q. What do you say about timber?—The timber was always considered low. We discussed the matter amongst us a good deal. Square timber 16×12, 33 cents per foot running; 15×12, 30 cents.

Q. What would you have considered a fair price for it?—In the adjoining contract (No. 14), made at the same time, or nearly so, it was 60 cents; and for this the timber is more easily got. I will just read from Mr. Whitehead's contract: "Timber, 16×12, 33 cents per foot run." On the next contract adjoining the same sized timber is 60 cents; then 15×12, 30 cents; and 15×9, 30 cents. I have no corresponding sizes on the next contract; but here is 12×12, 30 cents, contract No. 15, and 40 cents on contract 14. It is in the large timber that the prices differ much.

By the Honorable Mr. Macpherson:—

Q. What is the rate for rock, contract 14?—$2. It was let some time before 15.

Q. What is Mr. Whitehead's?—His is $2.75.

By the Honorable Mr. Scott:—

Q. Was not Whitehead more difficult to get at?—It is more removed from the river, although the rock work on contract 14 was as difficult to get at. They could not get horses over the swampy ground, and had to take their supplies on men's backs.

By the Honorable Mr. Macpherson:—

Q. What is the price for loose rock on contract 14?—$1.00.

Q. And on contract 15?—$1.75.

Q. What is the earth?—The earth on contract 15, is 37 cents; on contract 14, it is 26 cents. That is a large difference.

By the Honorable Mr. Penny:—

Q. Then all the prices in contract 15 seem to be very much higher than in contract 14?—Yes, except the timber.

By the Honorable Mr. Macpherson:—

Q. Is it in the articles on which the higher rates are placed that the increase has taken place?—The increase is principally on rock and earth, and on those the rates are very high.

By the Honorable Mr. McLelan:—

Q. Are those prices unusual on contracts in this country?—This part of Ontario differs very much from that part of the country. Rock is done from one dollar to a dollar and a quarter per yard in this country, and it is generally limestone or other stratified rock; but in that part of the country there is not only a different kind of rock to be taken into consideration, but the expense of getting in supplies.

By the Honorable Mr. Scott:—

Q. You have to make a railroad to get to it?—No; but you have to pay high for getting in freight. The way Mr. Whitehead got in his supplies was in summer time from Winnipeg by the Dawson Route to North-West Angle, about 110 miles, and thence by steamboat to Rat Portage; in winter time they had a shorter route with sleighs.

Q. What are Mr. Whitehead's prices for rock?—$2.75.

Q. And earth?—37 cents.

Q. A large number of the tenders seem to be in that neighbourhood?—I never saw any of the tenders at all. I had nothing to do with the work until after it was let. Allow me to answer the question more fully about the tenders being inconsistent. They were inconsistent in more ways than one: for instance, some of those tenders were very high for rock and earth, and on timber very low. But while he had $2.75 for open rock cutting, he had only $2 per cubic yard for tunnel work which is worth four or five times as much as the other—say nine dollars a cubic yard.

By the Honorable Mr. Haythorne:—

Q. Was the stone of the same character in both cases?—Yes.

By the Honorable Mr. Scott:—

Q. What size were the tunnels?—They varied from six to twenty feet.

Q. How much do you say they tendered for?—Two dollars per cubic yard; that is the line tunneling on the railway. There are also tunnels for streams; instead of building culverts they cut tunnels through the rock to let the streams through.

By the Honorable Mr. McLelan :—

Q. Has all the line tunneling been executed?—No; it is not all finished yet. There are about a hundred feet to finish. If you look at Mr. Whitehead's own tender you will find it is different from this. No man knows better than Mr. Whitehead that this was a thoroughly inconsistent tender.

By the Honorable Mr. Scott :—

Q. Was this Charleton's tender?—No; it was Sutton & Thompson's.

Q. I see in the other nineteen tenders that the average price for tunneling is about three dollars a yard?—The difficulty of inconsistent tenders is this: if there is a price on a certain item very high, and there is a small quantity in the original bill of works, if that quantity should be increased it may possibly turn out that the lowest tender had not been accepted.

Q. In asking whether the rates were unusually high, would not the fair way be to take the other tenders and compare one with the other. That would be the only guide, because we have no experience up there?—I suppose so. It is a very bad plan to make a radical change in works after the contract is let. If the change had been made to the injury of the contractor, he would have broken down, but in this case it has been in his favor.

By the Honorable Mr. Macpherson :—

Q. It could not be made without his consent?—Yes; it can be done without his consent. That is the reason why tenders on the Schedule of works should be as consistent as possible, so that whatever changes are made, they will not be for the benefit or the injury of the contractor, and so that he may have a reasonable profit on his work.

By the Honorable Mr. McLelan :—

Q. In that distance of 36 miles, are you likely to get lower tenders for removing 3,000,000 feet of earth, or 1,000,000 feet?—It depends a good deal on the nature of the section. In a flat section like No. 14, it would make no difference to the contractor; it is the same sort of work throughout, and requires only light plant; but in a section like this, heavy machinery is required—locomotives and steam-shovels. In fact, Mr. Whitehead says he will have four locomotives at work. Having gone to an expense like that, he can do a large quantity at a cheaper rate than a small quantity, because the expense of the plant is spread over a larger quantity of work.

Q. Then, the contractor would regulate his price according to the circumstances?—Yes.

Q. And would be likely to tender lower for a larger quantity?—Very likely.

Q. Has the trestle work been taken out of the other sections, 14 and 25?—No; it has been put in. Compared with this section the quantity is small. It was all put in that, as originally estimated.

Q. I suppose you know something as to the policy of putting in that trestle work?—Yes. It was the policy of the Government not to get a first-class railway like the Intercolonial (which is a very solid, well-built road, probably the best on the continent) but a road which would cost less per mile and, if possible, to get earlier communication with the North-West.

Q. Suppose you had railway communication with that country, is not $2.75 for rock and 37 cents for earth an excessive price?—You could do earthwork at a great deal less cost, but you could not do rockwork for much less, because the cost is in drilling and blasting, and not in long hauling.

Q. Is not $2.75 a yard an excessive price if you have facilities for getting there?—After you have facilities there you could get it done by the same men for $2 per yard.

By the Honorable Mr. Penny:—

Q. But, in the meantime, wou would have to get rid of the trestle work if the other were to take its place?—Of course, it is perishable work. As an engineer, I would rather have permanent work.

By the Honorable Mr. Scott:—

Q. I understood you to say just now that there was very little trestle work on the other portion?—I mean by that, that as the country is not so rough, there is very little in proportion to the trestle work on this. It is, however, all trestle work in the other sections; there is no masonry.

By the Honorable Mr. Christie:—

Q. How long does trestle work last generally?—It is estimated to last about ten years—good trestle work. Some lasts longer, and some, a shorter time than that. To give you an instance of how it sometimes lasts I may state that there was trestle work put over the Desjardins Canal, near Hamilton. I was associate chief engineer of that road in 1854. That trestle work was only done away with five or six years ago, so that it actually lasted about twenty years; but it was very fine trestle work.

Q. But the average life of trestle work is ten years?—Yes.

By the Honorable Mr. Scott:—

Q. What is the timber up there?—Principally spruce and tamarack. There is not much white pine for the larger sized timber required. The contractors for section 14 imported their larger timber from Minnesota.

By the Honorable Mr. Penny:—

Q. Is there anything allowed for hauling timber?—The specification contemplated that there would be timber in the locality, that is one of the causes of dispute that arose. The specification says it is to be made of the most suitable timber found in the neighbourhood.

Q. What I want to come to is this: Whether the contractor, if he had to go a distance for the timber, would have to be paid extra for it?—He would not be paid for hauling whether there was timber on the spot or whether it would have to be brought from a distance.

By the Honorable Mr. Macpherson:—

Q. If the timber had been there I suppose it would have been used, and the ravines could have been filled up with embankment by the time the trestle-work had decayed?—Yes, of course it could be done cheaper if the trestle-work was up.

By the Honorable Mr. Penny:—

Q. But you would have to pay twice over for the building of the road?—Yes, and in some cases it would be cheaper after all. That is the way the Union and Central Pacific Railroads were built. The trestle-work was put up, subsequently to be replaced with permanent embankment.

By the Honorable Mr. McLelan:—

Q. I see M. Rowan makes his calculations on filling this up at 28 cents a yard?—Yes, he thinks it can be done at that rate; nine cents less than the contract price.

Q. Section 14 is at 23 cents?—Yes.

Q. And one of the new contracts is let at 25 cents?—Yes.

Q. I should imagine that under the changed circumstances of having the railway, 28 cents is an excessive price, taking these two as a guide?—It depends upon the hauling. There is an average haul of six or eight miles, and whatever facilities you have, you cannot carry a cubic yard of earth by railway even for less than a cent per mile.

Q. They give as a reason that there was danger from fire. The same danger existed, I suppose, before the first letting of the contract?—Yes. In fact, everything was known to the engineers, as far as I could find out. When I found out that the change was going to be made, I made enquiries, and ascertained that they knew everything about it.

Q. That was not a new reason at all?—It was not.

Q. The proposition here in making the change was to fill it up with earthwork?—It is to be filled up partly with earth and partly with rock. There are quite a number of small lakes to cross, and earth embankments of course, would not stand in them. Some of them had from ten to twenty-five feet deep of water. It is proposed to make a narrow rock embankment six feet wide on top at each side up to the level of the water and fill with earth between.

Q. Mr. Rowan's estimate of the cost of the change is based upon earth filling. He says in his letter: Cost of completing the banks with earth instead of trestle-work, $550,000; deduct trestle-work, $362,000, leaving the increased cost $118,000. Mr. Whitehead, in his letter, says 1,443,281 cubic yards of earth would cost $530,000; timber and culverts would bring it up to $620,000; trestle-work taken away, $362,000, leaving a balance of $258,000. So that Mr. Rowan's estimate seems to be based altogether on making the fillings of earth?—It may appear so there, but that was not his intention. His intention was to make these rock embankments. They are sketched at the end of his report.

Q. Mr. Rowan bases his calculation altogether upon filling it up with earth?—It appears so from that statement you have read. I presume he thought he would get enough rock out of the cutting to make those embankments. It has turned out, however, that he has had to borrow some. I know that Mr. Rowan proposed to do it the way I have described.

Q. The point I was directing attention to is this: Is Mr. Rowan's estimate based upon filling the embankments all with earth?—Yes, with the edge of the slope protected by rock.

Q. Has he made any allowance for any rock in this letter which I have shown to you?—He has made none; but I know it was his attention to make rock embankments, and, consequently, he must have assumed that the rock coming out of the cuttings would be sufficient.

Q. But his calculations are all based on earth, while in the work a part of that is put in as rock at $2.75 a yard?—Yes, but that would go into the embankment, any way.

Q. He bases his calculations on one and a quarter millions of cubic yards of earth, at thirty-seven cents a yard, to make up the embankments. Then, instead of doing that, the earth part is being done with rock at $2.75 a yard?—Yes, but that rock is paid for. It is taken out of the cuttings, and instead of making the full embankment up with rock and letting it go as far as the quantity would extend, he makes them divide it, and make two lower embankments at the side, and puts earth in between.

By the Honorable Mr. Scott:—

Q. It does not add to the cost?—It does not add to the quantity of rock, unless there is not sufficient rock in the cuttings to make the embankments. When I went over there, I found that they had not sufficient information to make an approximate estimate. The water is 10 to 25 feet deep, and the depth of the mud they don't know, except by sounding with a pole. I found, in some places, these protection embankments were sinking down very much—that it was taking more rock to protect them than the engineer had expected from the soundings made by a pole, and I immediately sent to Ottawa to have a set of boring tools sent out, so that they could ascertain what was required.

By the Honorable Mr. Macpherson:—

Q. Was it after the change was made that you discovered that difficulty?—Yes; I discovered that, last autumn, when I was going over the work. But the engineers had been on the ground for three years, and all these things ought to have been attended to long before.

Q. Is the only reason for lowering the grade, to obtain additional rock for these fillings?—It was more to obtain earth. Barely sufficient earth could be found at all,

and by lowering the grade it lessened the quantity of earth very much, but it also increased the rock to some extent, not so large a proportion, but to a considerable extent.

By the Honorable Mr. McLelan:—

Q. You gather from the papers that the change was made on the supposition that it would increase the cost by $258,000?—Yes.

Q. And, in fact, so far as the work has gone, according to your estimate, the cost has been increased by $980,000?—Yes.

Q. A difference of some $700,000?—Yes.

By the Honorable Mr. Macpherson:—

Q. I understood you to say, that you are not at all certain that the quantity estimated will not be exceeded?—I do not think it will be less, and my impression was when I was there that the estimated quantities were being exceeded.

Q. Have you ascertained that any further payments have been made to the contractors on section 25?—I saw Mr. Fleming's chief assistant, he said that he did not know of any, but he would ask. No further claim has come before him. If there is any, it may have been sent to the Minister.

TUESDAY, 8th April, 1879.

Mr. SANDFORD FLEMING, C. E., Chief Engineer of the Canadian Pacific Railway, called and sworn, was examined as follows:—

By the Honorable Mr. Macpherson:—

Q. We want information on section 13, beginning at Kaministiquia and extending to Sunshine Creek?—I may not be able to give you as full information as you desire, because I am not blessed with a good memory for detail, but I will be happy to furnish what I can.

Q. This document marked A is a schedule of the works fyled by Mr. Marcus Smith, and sworn to by him, showing the amount of work as estimated. Is that correct?—I imagine that it is correct, but I never saw the sheet before. It appears to be a copy of the original.

Q. What is the additional amount expended on this section. Probably it would be better to explain to the committee about this work. There was a change in it, was there not. It was originally let to Shebandowen, was it not?—I have read the evidence of Mr. Smith. As far as I remember it, it is substantially correct. There are some parts, in which I don't entirely agree with him, but the quantities, &c., are pretty nearly correct, I believe.

Q. Was the work, in your opinion, thoroughly surveyed before the estimate was prepared?—It was not thoroughly surveyed, it was done hurriedly.

Q. Were you unwilling to have the contracts let upon it as it was?—No, I was very anxious to have the contracts let. I thought it was very important for the public interest, that the line should be built as speedily as possible.

Q. Was it not important that the estimate of its cost should be accurately ascertained?—It is important, but I thought it was still more important that the work should be done.

Q. Did you represent to the Minister that this estimate of the cost was unreliable?—I represented to the Minister that this was simply a means of comparing tenders, that it had no pretensions to accuracy as to the final cost of the line.

Q. Did you state that in writing to the Minister?—I am not aware that I did. I do not remember at this moment whether I did or not.

Q. Are you sure that he did not understand it to be an estimate of the cost?—I am quite sure that he understood it as a means of comparing tenders. He may possibly have understood it differently from me.

Q. He may have understood it to have been an estimate of the cost?—He may.

Q. Can you not say whether you made a report to him in writing upon the subject ?—If I made a report it would be in my letter-book, and, if you will allow me, I will send for that book for January, 1875.

Q. Was that section a difficult one to survey ?—It was not difficult to survey, but before the letting of this work we had been making surveys in a great many directions, in order to decide, not so much the precise line, as the route to follow. Some of these surveys were made in the summer and some of them in the winter. If I recollect rightly, this portion of the survey was made in the winter, and it was done in detailed portions; and from those surveys the quantities were taken out roughly. Those quantities were to enable us to money out the prices at which each contractor could tender, to make a comparison of tenders.

Q. In such uncertainty as you say there was in that case, would you not make greater allowances in quantities, so that the estimate might not be exceeded ?—It is proper to make allowance, and I regret very much that sufficient allowances have not been made in these cases.

Q. Was there anything in the character of the work to have misled the engineer making the surveys ?—The surveys made in the winter doubtless were misleading, so far as the nature of the soil was concerned. They may have taken very soft ground, such as muskegs, for hard ground.

Q. Were there muskegs on this section ?—Not on this section, but there was quite soft ground.

Q. Did it prove, in the execution of the work, that there really was that in it which excused so great a discrepancy ?—I do not think there is a very great discrepancy in this particular section (No. 13). I am not aware that there is.

Q. What is the difference ?—$61,000. I do not look upon that as a very great discrepancy. I would much prefer if there had been no discrepancy. I would have preferred it had been the other way.

Q. Was there anything in the character of the work, developed in its execution, to excuse any discrepancy, as great a discrepancy as that ?—When the work was let, we did not even know where we were going to; we were making surveys by Lake Shebandowan, on a direct line to Rat Portage, on the route spoken of when last I appeared before a Committee of the Senate. Having found that we could not possibly get through that way without an enormous expenditure, the line in this very section was changed. Instead of going to Lake Shebandowan, we branched off at a place called Sunshine Creek, 15 or 16 miles this side of Lake Shebandowan.

Q. Who were the engineers that surveyed it ?—Various engineers. I do not very well remember now who they were. I remember Mr. Murdock had something to do with it. So had Mr. McLennan, and Mr. Hazlewood and others.

Q. Is it not difficult when so large a number of engineers are employed on so small a work as that, to get a correct estimate ?—They were not all engaged at the one time. They were engaged in running different lines over that portion of the country.

Q. Who made the locating survey ?—I think it was made by Mr. Hazlewood, or Mr. McLennan.

By the Honorable Mr. Penny :—

Q. Did not Mr. Murdock make it in the first instance, and Mr. Hazlewood effect a change ?—I think so. I think Mr. Murdock made the first survey; I am not sure that he made the locating survey. The work was revised by Mr. Hazlewood afterwards, and the line that is built was located under Mr. Hazlewood's direction.

Q. You say that you don't think the discrepancy large; do you know other cases where discrepancies have occurred ?—Yes, many.

Q. Can you mention any of them ?—I could, if I had time to hunt them up.

Q. Could you give us any that we would be naturally acquainted with as coming under our own observation ?—There are few contracts let in this way where there is not a similar discrepancy. This contract was let before we had sufficient information to enable us to compute the total cost.

Q. However, you say that such things are by no means uncommon?—By no means uncommon.

Q. Mr. Hazlewood is the gentleman who located the line, and Mr. Smith did not like to say much about him, as he was dead, etc., but he said that the gentleman had not made the survey in such a manner as he ought to have done. We also ascertained from Mr. Smith that Mr. Hazlewood had been employed on the Intercolonial Railway, and I wanted to know whether there was anything in his conduct on the Intercolonial Railway that caused him to be censured or dismissed, or anything of that kind?—I am perfectly certain that Mr. Smith could not have meant to reflect on the character of Mr. Hazlewood in any manner whatever. I have had a good many men under me on engineering works, and never had one in whom I had greater confidence than in Mr. Hazlewood. I had every confidence in his integrity and skill.

Q. So there was no fault to find in the employment of a gentleman in whom your confidence was so marked?—I looked upon Mr. Hazlewood as one of the best men on the Intercolonial Railway.

By the Honorable Mr. Macpherson:—

Q. Were you satisfied with his location of section No. 5 on the Intercolonial Railway?—I may say that I was well satisfied with every thing that Mr. Hazlewood did on the Intercolonial Railway.

By the Honorable Mr. Penny:—

Q. And you sanctioned his employment in this case?—I did most certainly.

Q. Of course he was not discharged from the Intercolonial Railway?—He was not. He was at work on the Intercolonial Railway when the principal work was finished and I was very glad indeed to get him on the Pacific Railway. He was a man I had the utmost confidence in. I wish we had a good many like Mr. Hazelewood on it now,

By the Honorable Mr. Macpherson:—

Q. The next section is No. 25; that is a continuation of this one?—Yes.

Q. I suppose you have read Mr. Smith's evidence upon this contract also?—I have glanced over it. The description of section 25 is generally correct.

Q. There is a decrease of solid rock excavation, over 240,000 yards as estimated of 76,800 yards as executed?—I may state to the Committee that I was very much surprised indeed to find that there was such an alarming increase in the quantities of that section. It first came under my notice in December last. I think one of the contractors applied for the final certificate, or the portion of the drawback that had been withheld, about $50,000 I think, In looking over the matter with a view to ascertaining whether it would be proper to grant either one or the other, I discovered that the quantities of the work on that section, were very much in excess of the quantities that were originally estimated at the beginning of the contract. Of course, I could not recommend that they should have any payment, and they have received no payment since. I recommended to the Minister that, in order to satisfy him and myself and the public that no mistake had been made, there should be a re-measurement of the work, and the Minister concurred in that view.

Q. What is the amount of their claim now?—I think that they had received payment according to the measurement for all that they had done, or nearly all that they had done, up to that time. I was not in the country, and it was done during my absence.

Q. What remains to be paid to them?—The work was far advanced, nearly completed, and they thought that they should have the ten per cent. that had been retained, or at least a considerable portion of it. They wanted to get $50,000 of the percentage, but the request was not complied with.

Q. What amount did you retain in the hands of the Government?—I am informed that about $75,000 at this moment is kept back from them.

Q. Is the work to be re-measured?—It is.

By the Honourable Mr. McLelan :—

Q. Is that in addition to the sum they have deposited as security?—In addition to the security, as I have stated, This is simply the money that would be paid to them on the work being satisfactorily completed.

Q. Then no part of the sum doposited as security has been returned?—There was no money deposited, but there was some other form of security.

By the Honourable Mr Macpherson :—

Q. I think that has been introduced more recently?—I think there was substantial security deposited at the time. There was about 130,000 security deposited.

Q. Do you mean to say that there is $205,000 in the hands of the Government which they claim to be theirs?—Yes; something like $205,000 in the hands of the Government, not in money, but in money and securities. I have sent to ascertain the exact character of the securities.

Q. Have you any reason to suppose that the work has been over-measured?—I cannot imagine that the work has been over-measured; I have confidence in the men who measured it, but there might have been a mistake.

Q. Who were the engineers?—Since my poor friend, Hazlewood, died, Mr. McLennan has been acting in his place, and he has had other engineers under him who made the measurements.

Q. Has he reported to you, and explained to you the increase of the work?—He has not explained to my satisfaction why there should be so large an increase. He states that the work returns as executed is correct, but I am not satisfied that it is. At all events, I think in the interest of the public a re-measurement should be made.

Q. Was there anything in the character of the work as developed in its execution which explains such discrepancy between the amount of work done and the original estimate?—That has been explained pretty well in Mr. Smith's evidence as I read it. He explains that there are many muskegs and soft wet ground that swallowed up a great deal of material, which soft places could not have been well known when the surveys were made over them in the winter time.

Q. Are there many muskegs on that section?—Yes; a great many—many miles.

Q. Deep muskegs?—Not all deep; some of them are shallow.

Q. What system have you adopted of getting over those muskegs in construction?—In some cases we make a corduroy platform for the embankment, and if they are shallow we do not.

Q. What do you do—fill up?—Yes.

Q. Are there many such platforms on section 25?—I cannot say how many.

Q. Is that the more economical way of construction?—Sometimes it is, but not invariably.

Q. When muskegs are deep I suppose it is?—When the embankment is heavy it will find its way to the bottom no matter what you may put under it in the way of logs and brush.

Q. Are the embankments heavy on this section?—Some of them are light, and some of them more or less heavy. As a rule, a great many of the embankments are light.

Q. Have you been over the work yourself?—I have not.

Q. You have not seen it, since it was located?—I have not.

By the Honorable Mr. Penny :—

Q. There is nothing in these surveys that could lead the permanent staff—Mr. Trudeau, the Deputy Minister, and still less the political Minister—to know that whatever line was exhibited to the contractor would turn out inaccurately?—I am quite sure that if I was deceived by the result of the surveys, they could know no more than I did.

Q. Beyond the Department has the public lost anything by the increase—I wish to know whether, if the facts had been known, the cost would have been as great as it is now?—I do not see that the public has lost anything. The work would have to be done some way or another.

By the Honorable Mr. Macpherson:—

Q. Did you report the increases to the Minister when you discovered them?—I did at once.

By the Honorable Mr. Penny:—

Q. How soon after the work was done did the Minister become aware of this?—Only a short time ago.

Q. So there was nothing in the clerical work that was done at the head of the Department to indicate what was going on along the line?—I do not clearly comprehend your question.

Q. Was there anything to show the Minister or the Deputy Minister that a great change had taken place on the work, and that the work was over-running the original estimates before you gave him the information?—I was out of Canada at the time. They may have known in my absence. I am not aware that they did know until I informed them myself.

Q. Was there anything naturally in the work itself that would attract their attention to it?—Not unless it was reported to them.

By the Honorable Mr. Macpherson:—

Q. Would not the resident enginner report to them?—All the reports of that nature from the resident engineer should doubtless be communicated to the Minister, but I am not sure that any thing of the kind was done.

Q. I see that the latest return of executed work was made on the 30th November last. That showed an increase of about 33⅓ per cent. over the estimate; ought not that great increase to have attracted the attention of the Minister here?—No doubt it would on examination.

Q. But you do not know whether it did?—I do not know what action may have been taken by them. I can only speak for myself; I was not in the country at the time.

By the Honorable Mr. Penny:—

Q. Did these progress estimates go to the political Minister?—He never sees them unless he calls for them.

Q. And he would not call for them unless his attention was attracted to them?—Not unless there was something to attract his attention.

By the Honorable Mr. Macpherson:—

Q. But if they exceeded the original estimates largely, would it not be the duty of his assistsnts to bring the facts under his attention?—I suppose so, and that was done.

Q. When?—It was done on the first occasion when it came officially under my own notice.

Q. About what time?—Late in the fall, possibly in December, after the boats stopped running on Lake Superior.

Q. That was after the change of Government?—Yes.

Q. Then the increases all took place during the reign of the former Government. The last return was dated the 13th November; was it not brought under the notice of Mr. Mackenzie?—I was not in the country until the end of October.

By the Honorable Mr. Macpherson:—

Q. Did you ascertain under what certificates? Do the monthly certificates show how much was paid on account to the contractor, up to that time?—Yes, as I explained already, the contractors applied, when they returned from the work by the last steamer on Lake Superior, to me for a portion of the percentage. Before recommending it, I looked into the matter and found that they had already received more money than the original estimate.

Q. What I want to ask is this: Would not the monthly certificate as it passed their offices showed the amount paid on that contract, or certified to be paid on that contract?—Yes, in each office.

Q. And that, going through all the Departments would show, whoever handled it, that a certain amount had been paid?—Yes, in the Finance and other Departments that had anything to do it.

Q. So there really would be a knowledge of the amount in the Departments?—Yes, the Departments were apprised of the money paid.

By the Honorable Mr. Penny:—

Q. These gentlemen through whose hands these documents passed, necessarily saw that the work was running a great deal ahead of the estimate, or would that only be discovered at the end of the job?—I fancy that payments would be made without looking into the matter at all.

Q. In the ordinary routine of business?—Yes.

By the Honorable Mr. Macpherson:—

Q. But was not the total of the amount certified on the face of every certificate?—Certainly.

Q. Then that certificate would be seen in all the offices through which it passed?—Yes.

By the Honorable Mr. McLelan:—

Q. I understand you to say that section 13 was let because it was thought desirable to commence immediately on the section?—Yes.

Q. And therefore that the surveys were not completed?—Yes.

Q. You considered it important to commence work at once?—Yes.

Q. Section 25 which adjoins that was let fourteen months afterwards; was there not time to make a thorough survey?—No, our efforts were directed to find a route, if possible, through by Lake Shebandowan, in a straight line to the Lake of the Woods. We spent a good deal of time and money in endeavouring to get through that way. Having failed in that, we had to find some other line, and the surveys on the Northern route were done somewhat hastily.

Q. After you selected the route for section 13, and after you changed it and located 32½ miles of it, you had some knowledge of the route the line would take?—My answer is correct if I understand your question.

Q. About the time that section 13 was let, you made a change in the general route of the line?—Yes.

Q. And that took 32½ miles out of it?—Yes.

Q. At that time you must have known that you were changing the general line?—Between that period and the letting of the contracts no great time elapsed.

Q. There appeared to have been fourteen months, or, at all events, a year in round numbers?—I will explain by a diagram. The original section ran through Thunder Bay and Shebandowan. We endeavored to get as direct a line as possible by way of Sturgeon Falls to the North-West angle, or Rat Portage. In the meantime, the first contract was let, and they commenced at the eastern end, and they were at work by the time we discovered that we could not get a practicable line *viâ* Sturgeon Falls. A good deal of the road had been built. Some work had been done also at the western end, I think, but not much beyond clearing. We made a survey to the north, leaving section 13 at Sunshine Creek. From that point to English River, is the portion of section 25 where the grading was required to be done.

Q. Do you know how long it was after the letting of this, before you determined upon that deviation?—It was some considerable time after the work was started on the eastern end, if my recollection is right.

By the Honorable Mr. Macpherson:—

Q. You said when we were on section 13 that you considered it more important to commence the work, than to have it thoroughly surveyed before commencing. You meant by that, I suppose, that it was the policy of the Government to do that and that you were instructed by them to that effect?—No; not quite that. I felt, as an individual Canadian, that it was important to have a connection between Lake Superior and Manitoba as soon as possible.

Q. Was not that a matter for the Government to decide?—It was a matter of deep public importance.

Q. But the public are represented by the Government?—Everybody I came in contact with felt that it was very important.

Q. But you did not let the work without the sanction of the Government?—No doubt the Government felt as the public did, that it was important to be done.

Q. In short, was it not done under instructions from the Government?—Of course, everything of that kind was done under instructions from the Government. This country between Sunshine Creek and the North-West angle is a perfect wilderness, and we knew that every mile that was built would diminish the difficulty of getting through it, because we could only work from the two ends. There are no roads through the country at all.

By the Honorable Mr. McLelan:—

Q. Was the policy to connect by water with Port Savanne?—The policy was to commence the navigation of the Rainy River at Sturgeon Falls. It was demonstrated that we could not build a railway through that way except at enormous cost, and that policy had to be abandoned.

Q. That is, that if at any future time it might be thought desirable to extend the line beyond Sturgeon Falls, it could not be done except at enormous cost?—It could not.

By the Honorable Mr. Haythorne:—

Q. What made you persist in your efforts to proceed by Sturgeon Falls?—I felt the importance of it, and I was directed to do so by the Minister.

Q. Were there any previous surveys or anything to lead you to believe there was a practicable route by that direction?—No; but, looking at the map, it was thought very desirable to have a line that way. From Sturgeon Falls to the far end of Lake of the Woods, a distance of several hundreds of miles, it is navigable with the exception of Fort Frances Falls.

By the Honorable Mr. Penny:—

Q. Had not Mr. Dawson made a survey of that route some time before?—Mr. Dawson had spoken of it, but I think he never made a survey of it. I do not think that any survey was made until we made it.

Q. I am quite aware that there was no instrumental survey, but I thought that Mr. Dawson had made a report which led to the idea that there was a practicable route that way?—Mr Dawson advocated it very strongly and very wisely; but we found that we could not get a route that way.

By the Honorable Mr. Macpherson:—

Q. Was not the route which was recommended by Mr. Dawson that by the Narrows of the Lake of the Woods, crossing at the North-West Angle?—Yes.

Q. But he never made any recommendation, nor reported having made an exploratory survey by Rat Portage, but he recommended the route by the Narrows of the Lake of the Woods?—I do not know that he made any special survey.

By the Honorable Mr. Penny:—

Q. At all events, his idea was to use those water stretches?—Yes.

By the Honorable Mr. McLelan:—

Q. You said that the object of estimates is for a comparison of tenders?—Yes.

Q. Can you get a correct comparison of tenders without a correct estimate?—You can get an approximate and fair comparison of tenders in that way.

Q. In case of section 25, where earth has been more than doubled, and solid rock reduced two-thirds, was it a fair comparison of tenders?—Yes, sufficient for the purpose, and I do not know any other way in which you could do it. As proof that the system is the correct one, I will state to you that the increased quantities have been moneyd out at the prices in the schedule of the five or six lowest tenders, and we find that the public interests have not greatly suffered by the discrepancy in the original and subsequent quantities.

Q. But is it probable that the contractors, if they had known that the quantities would have varied so much, would have made the same tenders? Do you think so from your knowledge of the tenders?—A great deal may be said on that and any other subject, but we have no other way of getting at the quantities. I hold that it is the best way of letting the work. I don't know any other way by which it could be done better.

By the Honorable Mr. Macpherson :—

Q. Do we understand you to say that the correct quantities could not be ascertained almost to exactness?—Not in the time.

Q. By a survey they could have been ascertained?—By taking a sufficient time they could have been, not with perfect exactness, but approximately.

Q. And as likely to exceed as to fall under the estimate?—I suppose so.

By the Honorable Mr. Haythorne :—

Q. Mr. Smith explained as a cause of the increase of expenditure, that proper precautions had not been taken to prevent the sinking of embankments in the muskegs; do you agree with him?—With a good deal of his evidence; not entirely.

Section 14.

By the Honorable Mr. Macpherson :—

Q. You have read Mr. Smith's evidence with reference to this section, I suppose?—Yes.

Q. Do you agree with it substiantially?—Yes, a great deal of it.

Q. All with respect to the quantities?—Yes; I take it the quantities are the office quantities.

Q. I see that the estimated cost of the work was $402,950, and the amount paid for it was $658,849, and $722,134 is the amount estimated to complete it; is not that so?—According to the return placed in my hand the value of the work done on on section 14 is $658,849, but that has not all been paid.

Q. And the estimate of the cost of the work to be completed is $722,134, is it not?—Yes.

Q. When was that work let?—The advertisement calling for tenders was published in the spring of 1875; tenders were to be received on the 18th March, 1875.

Q. And it was let about that time, I suppose?—Soon after that, I imagine.

Q. Was that line thoroughly surveyed before it was let?—No; the same remarks apply to that as to the other line.

Q. Was Selkirk fixed upon as the crossing point of the Red River before the line was thoroughly surveyed?—I think so, or about the same time that it was surveyed.

Q. Selkirk was fixed upon and the line was then run eastward from it?—It was either run from it or to it. Selkirk was fixed upon and connected with Rat Portage by survey.

Q. Was Selkirk fixed upon before the country between Rat Portage and the Red River was thoroughly surveyed?—I think so; or at the same time that the surveys were going on.

Q. Have you reason to believe that there is an easier line than that on which the road has been constructed between Rat Portage and Selkirk, a little south of the located line?—No; I have no reason to believe that there is; we could have a line that would be longer and possibly heavier. That matter was thoroughly looked into.

Q. Was not a line explored by which you would have got out of the rock sooner?—You are quite right; the length of the rocky section would have been less, but it would have been heavier.

Q. Do you believe that the line adopted is less costly?—I did at the time, and I still think so. I have no reason to change my mind; it is shorter.

Q. Do you mean shorter to the Red River or to the Pacific?—Shorter to Selkirk as the objective point.

Q. Is there no point on the Red River south of Selkirk as eligible for crossing as Selkirk?—We did not discover one so eligible as Selkirk.

Q. Are you of opinion that there is not one?—I am of opinion that there is not one.

Q. Have you had it surveyed?—It was thoroughly surveyed at the time, and I have never heard anything to lead me to a contrary opinion.

Q. Did you examine the river yourself?—I saw the river but I did not thoroughly examine it myself. Selkirk was fixed upon, on good sound reasons.

By the Honorable Mr. Penny:—

Q. Of an engineering character?—Yes; and of a general character.

By the Honorable Mr. Haythorne:—

Q. Were not some of the reasons connected with the flooding there?—Yes; it was stated, and I have never heard the statement called in question by any one who knows anything about it, that at Selkirk the banks of the river have never been flooded, but that at Winnipeg and in that direction, twice within the last quarter of a century the banks have been flooded for many miles on each side of the river.

By the Honorable Mr. Macpherson:—

Q. Is there not a point near the Stone Fort where you could cross very well?—I suppose that you could cross there as well, or nearly as well, as at Selkirk; but we found that the land there was in the possession of the Hudson's Bay Company and private parties, and we did not think that it was right to build a line there, simply to enhance the value of their land. We thought it better to adopt a line through land owned by the Government.

Q. Is there no point near the Stone Fort where the land did not belong to the Hudson's Bay Company?—The nearest block of land that was not acquired by the Hudson's Bay Company or private individuals was that which was selected at Selkirk.

Q. Would any difference that there could have been in the value of the land have gone far towards paying for the work of constructing that railway?—It formed an element worthy of consideration.

Q. What is the value of the land by the acre there?—I do not know.

Q. It would be small, I suppose?—Well, we have found that it costs quite enough anywhere to acquire the right of way where the Government has to pay for it.

Q. Could you not have bought it in advance?—It is difficult for a Government to do that.

By the Honorable Mr. Penny:—

Q. I suppose when you would attempt to buy, the people would know what it was for?—Yes.

By the Honorable Mr. Haythorne:—

Q. Has the crossing at Selkirk given great additional value to the lands possessed by the Government in that vicinity?—That is the ordinary effect. The 500 acres owned by the Hudson's Bay Company at Winnipeg has been greatly advanced in value of late years.

By the Honorable Mr. Macpherson:—

Q. Is not that in consequence of the growth of Winnipeg?—Yes, and the prospect of the railway.

Q. Why should the placing of a bridge at Selkirk establish a town there?—I fancy, in this instance, it will have the effect of establishing a town, because it is the head of the navigation of Lake Winnipeg; it is a point where different local railways will converge, and it will be an important point on the Pacific Railway.

By the Honorable Mr. Haythorne:—

Q. Would not a good deal of freight meet the railway there?—Possibly there will be a great deal in the future.

By the Honorable Mr. Macpherson :—

Q. From where?—From the Saskatchewan.

Q. Would freight coming by converging railways be trans-shipped then? Would it not run through?—Every gentleman is as well able to form an opinion on that as myself.

Q. Can you give any information to the Committee on the expected cost of section 14?—I cannot; I have dealt with that in the same way as with section 25. I have suspended all payments until we have the work remeasured.

Q. What amount have you in hand as a reserve?—That I can find out, and inform you of.

By the Honorable Mr. Penny :—

Q. I suppose all that you said before with regard to section 13 as to the impossibility of giving a closer estimate in the first instance, and as to the fact of the public having lost nothing, applies to this as well as to the other?—In regard to that question, I have in my hand some calculations made a short time ago, and from these I see that the public have lost nothing by the increase in quantities; that is to say, the tenders, if all moneyed out, with the increased quantities, would be very much in the same relation to each other as they were originally.

By the Honorable Mr. McLelan :—

Q. That is taking the tenders as made on the advertised quantities?—Taking the tenders as they were received by the Government and moneying out the quantities.

Q. As a matter of course the tenders might have been different if the quantities had been known?—They might or they might not.

By the Honorable Mr. Macpherson :—

Q. There is a great deal of muskeg on this section, I believe?—Yes; there is a very heavy muskeg or swamp, called the Julius muskeg.

Q. How has it been crossed?—By digging very deep and very long ditches on the side of the railway to allow it to be dried up.

Q. With the experience that you have acquired would it not have been more economical to have corduroyed it?—I do not know. I have not seen it with my own eyes. It is not always expedient to put platforms in. They are often put in where they do no good. They simply sink with the embankment, and form so much of the cubic contents of the whole embankment. You are simply filling with timber instead of earth.

Q. Are the embankments heavy there?—I do not think they are very heavy. I cannot tell the number of feet above the surface there, but I do not think they are heavy.

Q. Where the muskegs are drained and dry, what is the nature of the material left?—A sort of peat.

Q. Is there any danger of that being burned?—It is usually covered with gravel. It forms a good embankment with gravel.

Q. But a spark from a locomotive getting into the ditches might set the peat on fire?—The ditches are generally wet, and I do not at present remember a case in which the embankment has taken fire. There seems to be a danger, but it is very slight.

Q. The placing of an embankment on that material, would it not have the effect of pressing it into the drains?—That shows itself very soon, and in a little time the whole becomes consolidated.

By the Honorable Mr. Penny :—

Q. I suppose the Minister and yourself have talked over all these matters since the accession of the new Ministry?—Yes, we have talked over nearly every matter.

Q. And he has not been disposed to censure you for the outcome of this work?—He has not been disposed to censure anybody that I know of.

By the Honorable Mr. Macpherson :—

Q. Who surveyed this section ?—Mr. Henry McLeod, I think.

Q. I suppose if the Minister had expressed like dissatisfaction, you would not feel at liberty to repeat it here ?—I am not aware that he has.

Q. Who is the engineer in charge of this work ? Who located it ?—I cannot remember who made the original survey. There was one survey made by Mr. Jarvis years ago, perhaps in the year 1873. The more recent surveys were made under Mr. Sewan, and no one was more surprised than myself to find the quantities so greatly exceeded. I was very much dissappointed. I had hoped that in every case we had made sufficient allowance for everything, but it seems we had not in this case. As I said before, the whole thing was done very hurridly in the office at headquarters, simply on the profile furnished, and during the Session of Parliament, when everyone is worked at high pressure. It is not surprising that mistakes of this kind sometimes occur.

Q. Can you tell us what the survey cost between Lake Superior and Red River ?—I could not just now. I could tell you approximately in a little time.

Q. Do you not think that the headquarters of the Engineering Department is inconveniently remote from the work, being at Ottawa, here ?—Yes; but there is no place where you could have the headquarters on two or three thousand miles of railway that would be convenient to all the sections.

Q. But when you were building the railway between Lake Superior and Red River, it would be more convenient, I should think, to have the headquarters at Prince Arthur's Landing ?—It would be very inconvenient in winter. If any information were required by Parliament it could not be had.

Q. Would it not have been more convenient and advantageous in the public interest to have had a higher authority than the District Engineer's within reach, especially in winter when Ottawa is inaccessible to them ?—We have an office at Prince Arthur's Landing, and that would be a head office as far as that district is concerned, and was a head office until Mr. Hazlewood died. Unfortunately, for us and for the public, he died, and his place has never been filled since.

Q. He was the District Engineer ?—Yes; and a very able man he was when he was in good health. Some time before he died he was not in the best of health, and was not so able to attend to his duties as on the Intercolonial Railway.

WEDNESDAY, 9th April, 1879.

Mr. FLEMING recalled and further examined :

By the Honorable Mr. Macpherson :—

Q. What was the security deposited in the contract for section 14 ?—City of Toronto debentures, Canada Southern Railway bonds and bank deposit receipts, in all, $20,000.

Q How much of that is money ?—Ten thousand dollars in deposit receipts.

By the Honorable Mr. Penny :—

Q. And $75,000 besides of a draw-back ?—Not in section 14; the draw-back remaining is only $3,370.

By the Honorable Mr Macpherson :—

Q. What is the amount of their unsettled claim ? They have made a claim of some fifty or sixty thousand dollars, but it has not been allowed. It has been reported against.

Q. Then the Government withholds from them the amount of that claim, that is how much ?—A draw-back of $3,370, and security, $20,000.

Q. That is, awaiting re-measurement of the works ?—Yes.

Q. Will it be possible to make an accurate re-measurement?—It will be possible to make a re-measurement, I trust, that will satisfy myself and others as to whether there be any mistake or not. It will be difficult to make an accurate re-measurement of every portion of the work, but if it be narrowed down to a few items we will be enabled to judge of the accuracy of the whole.

Q. I suppose something will depend upon the nature of the earth moved?—Yes; we will have to send a man of judgment and experience to make a re-measurement, to begin at one end and measure it through to the other.

Q. Is any portion of the ground from which the earth for the embankments was taken, of a peaty or swampy nature?—Yes; there are some portions, and these are the points where I say that there will be some difficulty in making a close re-measurement, but if we narrow the whole thing down to these portions, we can use our judgment in the matter.

Q. Don't you believe that a large portion of this increase is in these swamps?—I have no doubt it is, but I cannot positively say.

Q. And in these swamps it will be most difficult to re-measure, will it not?—Yes.

By the Honorable Mr. Christie:—

Q. I fancy that it will be impossible in the portions of the embankments where they have sunk, to re-measure it?—We will have to make an estimate of it. We have the original level of the swamps, and we can find the new level and make the estimate accordingly. If, in testing all the measurements, we find that all but those connected with the swamp are perfectly accurate, we may reasonably assume that they are accurate too.

Q. Has the re-measurement anything to do with their claims?—No. It has nothing to do with their outside claim.

Q. What is the re-measurement for?—It is simply to test the accuracy of the returned quantities.

By the Honorable Mr. McLelan:—

Q. Upon which they have been paid?—Yes.

By the Honorable Mr. Macpherson:—

Q. Then what is the nature of their claim?—If you will allow me to send for it. I will explain it more satisfactorily than I can now.

Q. Can you give us a general idea. Are they for works not included in the estimates?—One is for making roads to their work.

Q. The committee would like to understand the real object of re-measurement, and what is to be gained by it?—The claim made has nothing to do with the re-measurement. They claim that they should be paid additional rates for some items, rates over and above those mentioned in the contract. That is one portion of the claim.

Q. We would like to have some similar information with regard to contract 13?—Contract 13 has been, I think, disposed of by settlement. I think the contractors have been paid in full. However, there is a mistake in the evidence in regard to No. 13. It was stated in Mr. Smith's evidence, and I think I said that I thought it was substantially correct so far as the amounts were concerned, inasmuch as they were obtained from the office, but I find that there is a little mistake. The original estimate for the contract when it was made for the 45 miles, was $406,194. The present length of the section (13) is 32½ miles or thereabouts. The proportion has been wrongly calculated.

Q. Mr. Smith made the amount different himself. He calculated it here and gave us the proportion. At that moment Mr. McLelan discovered in your report of the Canadian Pacific Railway, for 1877, that you stated the amount at a specific sum. Mr. Smith said, at my suggestion, or the suggestion of some member of the committee, that was, no doubt, correct; that his could only be approximate, being the proportion which one bore to the other, and that this, in your report, was, no doubt,

correct. So that, if there was any error in that it was because he assumed these figures to be correct?—That may be, but the proportion is as calculated for me; I have not done it myself. The date of my report is 1877. This is approximate; at that time we may not have known the exact length. The true amount is as I have stated.

By the Honorable Mr. Penny:—

Q. That reduces the discrepancy to $37,713. Sifton & Ward, $313,200; Purcell & Ryan, for completing their work, $18,598—in all, $331,798. The difference in in excess of the original estimate is therefore considerably less?—Yes.

By the Honorable Mr. McLelan:—

Q. Mr. Smith takes your figures, supposing you had returns from which you made them?—No doubt he said what he thought was correct.

By the Honorable Mr. Macpherson:—

Q. Contract 15. We wanted to see the earlier schedules of this work, and to know what the security is?—The Law Clerk informs me this morning that the contractor has deposited in mortgages $131,500, and the present amount of drawback held by the Government is $27,970. I have the same information with regard to section 25, if it is wanted.

Q. Let us have it?—Contract 25. The deposit is in direct mortgages, $10,000; in money and bank stock, $12,480; total, $22,480. The drawback at present is $64,210.

Q. What is the total security?—$86,690.

Q. What is the amount of their unsettled claim?—They have no unsettled claim, except that they have applied for a portion of the drawback, but it has been refused them. They applied for $50,000, but nothing has been paid them. Since then, the discovery was made, and it is not intended to pay them anything until the work has been re-measured.

Q. Are the difficulties of re-measurement there as great as on section 14?—I fancy the difficulties will be similar.

Q. How do you expect them to be different?—The difficult portion must extend over a greater length, but I do not think that any of the muskegs are so deep as the one on section 14. It is difficult to say whether it will be greater or less in degree.

Q. But the greater the depth of muskeg, the greater the difficulty of re-measuring?—It depends upon the borrowing pit. If the material with which the embankment has been formed comes out of a gravel or a sand pit, there will be no difficulty at all in re-measuring, but if it comes out of a muskeg it will be difficult.

Q. Section 15 was from Keewatin, Rat Portage, to Cross Lake, a distance of 36½ miles?—Yes.

Q. You have read Mr. Smith's evidence on this?—I have glanced over it.

Q. It is substantially correct, is it not?—There was no exact estimate of the cost of the work made at the beginning, and I believe there has not been until now.

Q. There was an estimate made, was there not?—There was an estimate of the quantities in the work made, to admit of a comparison of tenders.

Q. At the rates of the tender accepted, what did the cost of the work amount to, according to the original estimate?—These quantities referred to, moneyed out at the rates at which the contract was let, made a total sum of $1,594,085, according to this calculation.

Q. What is the date of the last return of the work executed?—I can only take it from the document placed in my hand, fyled by Mr. Smith. The matter has been managed by Mr. Smith. I have never before seen this return. This is the first time that I have seen the document. I do not, however, question its accuracy.

Q. What is the amount of work executed, at the date of the latest return?—According to the returns placed in my hands, the value of the work done is $1,279,972.

Q. And the estimated work remaining to be done?—According to the same return, the estimated work to be done is $1,245,027.

Q. Making the present estimated total cost of the work?—$2,525,000.

Q. And making a difference between the estimate on which the work was let and the present estimate cost, of how much?—Making a difference between the quantities furnished the contractors to money out their tenders and the present amount, of $931,000 or thereabouts.

Q. Have you reason to believe that that amount will finish the work?—I really do not know; I trust so. These calculations have not been made by me.

Q. Have you any doubt of their correctness?—I do not question their accuracy.

By the Honorable Mr. Scott:—

Q. This report of yours is dated the 22nd May, 1878; what time did you go to England, last year?—Soon after that.

Q. When did you return—in October or November?—About the last day of October.

By the Honorable Mr. Macpherson:—

Q. Tenders were invited twice before for this work?—Three times altogether.

Q. But twice before the contract was entered into?—Yes.

Q. What was the nature of the work at the first proposal?—The first letting was in March, 1875. The tenders then received were for the grading and bridging only; not for track-laying, ballasting, &c.

Q. Was the track under the first to be completed, and the grading to be completed?—The grading to be completed, but not the ballasting.

Q. Was there any trestle-work?—Very little. It was to be ready for laying the rails.

Q. And the track made solid with earth?—Yes; with some trifling exceptions where bridges would be wanted.

Q. Then, with respect to the second letting?—There was another letting in May, 1876.

Q. What was the nature of the specification there?—The excavation through cuttings, of course, was to be done, but the embankments were to be left incomplete, and the gaps filled up with trestle-work. The tenders did not include the cost of trestle-work, nor track-laying nor ballasting.

Q. And the third letting?—That was in September, 1876.

Q. Was that on the specification which had been furnished before?—The one on which the contract under discussion was made.

By the Honorable Mr. Penny:—

Q. You call those other transactions "lettings"?—I should not have called them "lettings;" I should have said "reception of tenders."

By the Honorable Mr. Macpherson:—

Q. What was the difference between the actual letting, and the second specification or proposition?—I have already explained that the second tendering embraced the through cuttings and parts of embankments, but nothing more. It did not include trestle-work, track-laying nor ballasting.

Q. Would a large quantity of trestle-work have been required to complete the grading?—Yes; a considerable quantity.

Q. Did the specification on which the work was actually let conform to the first specification for tendering?—No; the embankments were intended to be completed under the first tendering; under the second, the material which was found in through cutting was to be removed and placed in the embankment, and gaps left to be filled with trestle-work afterwards.

Q. Does the specification, as altered and amended since the contract has been let, approximate closely and substantially to the specification of the first tendering?—The Committee understand what was intended by the first tendering. It was intended to make the road ready for track-laying and ballasting. When the tenders came in it was found that the work would cost a great deal more than expected. It was then proposed to change the grade; that is to say, to make the excavations less and make the parallel gradients a few feet higher, so as to reduce the volume of the

through cuttings, and leave openings for the trestle-work. The trestle-work was not intended to be put up then, because it was thought that it would take considerable time to make the excavations and the timber would simply be rotting. By postponing the trestle-work the timber would last so much longer. Then, when we came to let the third time (although I was not then in Canada) I believe that the gradients were placed very much the same as they were on the second letting. They were not changed, but the difference between the third letting and the second letting was this: the third letting embraced the trestle-work, and track-laying and ballasting, as well as the through excavation.

By the Honorable Mr. McLelan:—

Q. Then, as I understand you, the cuttings and embankments were substantially the same in the second and third, but in the third the trestle work and tracklaying were put in?—Yes; I think that is it.

By the Honorable Mr. Scott:—

Q. I understood that they were more in the third?—No, I think they were substantially the same.

By the Honorable Mr. Macpherson:—

Q. The first really brought the construction up to what is known as "formation level"?—Yes.

Q. And the third gave the completed track, with rails laid?—Yes.

By the Honorable Mr. Scott:—

Q. Is the grade as easy on the second as on the last?—Yes, I think so; substantially the same, so far as that is concerned.

By the Honorable Mr. Macpherson:—

Q. Can you tell us what the amount of rock excavation was on the first?—I can furnish you with the bill of works as printed and exhibited to the contractors. The bill of works was prepared in February, 1875, to admit of a comparison of tenders. I wish to draw a distinction between these bills of works and exact estimate of quantities; I wish it to be distinctly understood that these bills of works were prepared for the special purpose of comparing tenders, and that only. The very amounts will show that they were round numbers—600,000; 500,000; 10,000, etc.,—all these indicate that it was simply a way, and the only way, we had to compare tenders.

By the Honorable Mr. Penny:—

Q. In fact there were no estimates?—They were very rude estimates.

By the Honorable Mr. Macpherson:—

Q. What was the estimated quantity of solid rock?—They were as good estimates as we could make at the time and under the circumstances. For anyone to pretend that more accurate estimates than these could be made is mere nonsense.

Q. State the quantities of rock, earth, off-takes and timber?—Solid rock, 600,000 cubic yards; loose rock, 40,000 cubic yards; earth, 900,000 yards; off-take, 20,000 yards.

By the Honorable Mr. McLelan:—

Q. What are the lowest prices on the first tendering?—The lowest was a little under one million dollars; the highest over $3,000,000. Mr. Whitehead's own tender was $2,999,620. Wardrope and Ross, $3,082,010.

By the Honorable Mr. Scott:—

Q. Does the observation which you applied to the first apply to the other also?—Yes; to all of them.

By the Honorable Mr. Macpherson:—

Q. What are the quantities of the second?—Solid rock, 320,000 cubic yards; loose rock, 30,000 cubic yards; earth, 80,000 cubic yards. That I don't understand. There must be a mistake of the scribe. It must have been 800,000 cubic yards of earth.

Q. Do you mean to say that this was the one that was submitted to the contractors?—Yes.

Q. And that was 80,000 cubic yards?—Yes.

Q. Was not the trestle-work intended to take the place of earth in the second tendering?—The trestle-work was intended to take the place of embankments in the second tendering.

Q. And does not that account for the small amount of earthwork?—Possibly.

Q. Have you the trestle-work in that?—No; because it was not intended to put up work that would be partially decayed or destroyed by fire before it was wanted. I foresaw that the line from Fort William to Keewatin would not be required for some years, and there was no use in putting that trestlework in then, because it would be half rotten before it could be used for traffic.

Q. Then, the third tendering?—The quantities appear to be the same as the second, with the addition of timber for trestles.

Q. Is not the solid rock excavation 20,000 cubic yards less than in the second letting?—Yes; it is 320,000 in the second, and 300,000 in the third, and the other items are the same as in the second, with the addition of a long list of timber for trestle-work.

Q. What were the quantities executed at the latest return?—The amount reported to be done at the end of February, 1879, was as follows: Solid rock, 342,276 cubic yards; loose rock, 46,711 cubic yards; earth, 224,306 cubic yards; off-takes, 2,264 cubic yards.

Q. You made great changes in this work after it was let, did you not?—Yes.

Q. We have a letter of your own to the Department of Public Works, addressed to the Secretary, recommending the change; I suppose it is a correct copy?—On the 22nd of May, 1878, I wrote a letter to the Department, recommending a change in the character of the work, and giving the reasons why I made the recommendation. The letter is as follows:—

CANADIAN PACIFIC RAILWAY,
OFFICE OF THE ENGINEER-IN-CHIEF,
OTTAWA, May 22nd, 1878.

SIR,—Mr. Whitehead, on the 6th November last, proposed by letter, addressed to Mr. Rowan, which letter is herewith enclosed, to complete the roadway on section 15 with permanent rock and earth embankments throughout, in lieu of wooden trestle-work, which was originally proposed to be built in many places. He proposes to find all the material required for making the solid embankmens at the contract price for earthwork (37 cents), and make no charge for extra haul for any that may have to be brought from long distances.

The district engineer reports, this date, that the contract cost of trestle-work, which would be dispensed with by the course proposed, would be about $360,000; that an additional present expenditure of $260,000 on earthwork under Mr. Whitehead's offer, including masonry culverts, would make all the embankments permanently solid.

As trestle-work is always more or less dangerous, especially liable to be consumed by fire during the dry season in a country such as the one the line goes through, and would have to be constantly renewed, until ultimately filled in solid. I am of opinion that it would be sound economy to accept Mr. Whitehead's offer, and therefore recommend it.

I am Sir,
Your obedient servant,

(Signed) SANDFORD FLEMING,
Engineer-in-Chief.

F. BRAUN, Esq.,
Secretary Department Public Works.

OTTAWA, 22nd May, 1878.

DEAR SIR,—Having received from the Division Engineer of contract 15 the estimate referred to in my letter of the 5th of March last, reporting on the subject of Mr. Whitehead's proposal:—"To make the embankments on contract 15 with *Earth* instead of *Trestle-work*," contained in his letter of the 5th November, 1877, which was enclosed in the above named letter of mine. I now submit further information on the subject, as follows:—

The cost of completing the banks with *earth* insted of *trestle-work* will be	$550,500 00
Deduct, trestle-work done away with in consequence	362,000 00
Balance	$188,500 00
Add for masonry and permanent structures, say	70,000 00
	$258,500 00

If trestle-work of the value given above ($362,000.00) is put in now:—Its cost, at 5 p.c. per annum compound interest, at end of 6 years, say $485,000.00. By which time it would have to be either partially or wholly renewed, or replaced by *earth filling*.

If the latter, and if this could then be put in at 28 cts. per c. yd. instead of at present contract rate of 37 cts. per c. yd. There must then be a further expenditure of $401,500 00

To which must be added as above, masonry and permanent structures 70,000 00

Cost at end of 6 years $956,500 00

The immediate increased cost of change ($620,344) would, if treated in the same manner, amount to the sum of $831,318 00

Leaving a balance in favour of the proposed change $125,182 00

Or putting it in another form as follows, the result would be:—Estimated cost of completing *now*, the banks with *earth* instead of *trestle-work*.

Earth, 1,433,281 cubic yards, at 37 cents	$530,313 97	
Timber in culverts, &c.	20,030 75	
Permanent structures	70,000 00	
	$620,344 72	
Trestle-work, done away	361,856 61	
		$258,488 11
Suppose *trestle-work put in now* at a cost of	$361,856 61	
And that it would last 10 *years* before being *replaced by earth*, 1,433,281 cubic yards, at 28 cents	401,318 68	
To which add timber in culverts	20,030 75	
do Permanent structures	70,000 00	
	$853,206 04	
Add 10 years' simple interest, at 5 per cent on $361,856 61 trestle-work	180,928 30	
		$1,034,134 34

If, for purposes of comparison, 10 years' simple interest at 5 per cent. per annum, be also added to :—

Present increased cost, on account of change.....	$620,344 72	
Interest	310,172 08	
		$930,516 80

Shewing a balance even this way of $103.617 54.

To this saving in money must also be added the important consideration, that portions, or *the whole of the trestle-work may be destroyed by fires*, which are of frequent occurrence in the woods through which the whole of this section of the railway passes. Should such an event occur, the traffic of the line would be seriously interrupted ; indeed, it is not at all improbable some portions of the trestle-work will be destroyed by fire before the line is opened.

These dangers will be entirely removed by the adoption of the course now recommended.

Yours truly,

SANDFORD FLEMING, Esq., Engineer in Chief. (Signed) JAMES H. ROWAN.

WINNIPEG, November 6th, 1877.

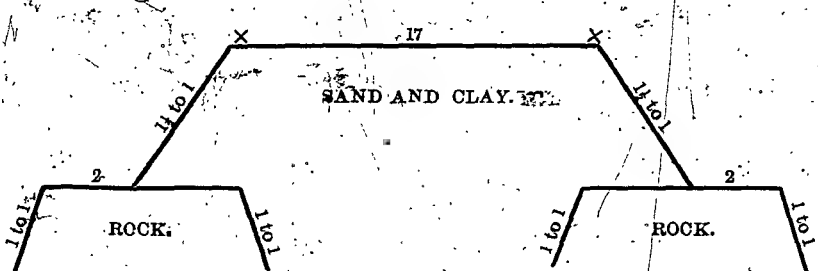
DEAR SIR,—I beg leave to make the following remarks, and proposition in reference to the work on contract 15, with a request that you will submit the same to the Government. The quantity of rock required to be placed in the base of embankment through lakes in order to make them wide enough to carry earth embankment subsequently, has to be carried such a distance over intervening spaces as to greatly retard the progress of the work.

The disproportion between the quantity of material in the cuttings, and that required to complete the embankments, will necessitate so very large an amount of trestle-work to bridge over the intervening space, that I cannot procure a sufficient quantity of suitable timber in the country with which to construct it. I have ascertained by recent investigation and the sinking of test pits, that sufficient or nearly sufficient material sand and clay can be obtained from borrowing pits to complete the whole of the banks, but some of this material would have to be hauled for a very considerable distance.

As, however, the adoption of this course would greatly facilitate my progress with work, I would beg leave to make the following proposal; which I believe will be found more economical for the Government also in the long run.

If the Government will consent to do away with the trestle-work altogether, and permit me to complete the banks with clay and sand, I will agree to find the necessary material at my present price per cubic yard for earth-work, and make no charge for extra haul, for any of the material required to do this, which has to be procured from borrowing pits.

And I will make up the embankments through water with rock banks carried up to three feet above high-water mark, and having a berm of two feet outside of the foot of the earth slope on the plan suggested by you, as in the accompanying sketch, without extra charge.



An early reply will greatly oblige, as it is necessary for me to make special arrangements for the transport of material if my proposal is approved of.

I remain,
Your obedient servant,

(Signed) JOSEPH WHITEHEAD.

JAMES H. ROWAN, Esq.

Q. You made that recommendation on Mr. Rowan's letter?—Yes.

Q. Did you examine his estimate, and satisfy yourself as to the increased cost?—I did not; I accepted his calculations as being perfectly correct.

Q. According to your own letter what was the estimate of the additional cost?—$260,000.

Q. How was the change ordered to be carried out?—I understood that this recommendation was favorably entertained. What was done afterwards, I do not know; I left for England. I am inclined to think, though my recollection is not very clear, that I spoke to Mr. Rowan, who was then going to Manitoba. I would naturally tell him that the embankments should be made solid and permanent, as the Minister seemed to favor the idea, but what action was taken, I do not know. It was not my place to do more than recommend it to the Minister, and my recommendation, if I recollect right, was approved, and I take it for granted that instructions were given to carry it out.

By the Honorable Mr. Scott :—

Q. Had you gone to England before the 12th of June?—I remember that I spent the Queen's birthday writing letters on the train between Quebec and Halifax; that was two days after the recommendation was made.

Q. Did you leave before the date of this document which I now show to you?—This is dated the 12th of June; I never saw it before.

Q. You were not here then?—No.

By the Honorable Mr. McLelan :—

Q. Had you any communication with the Minister on the matter?—The letter addressed to the Department is the communication.

Q. Had you any interview with him?—I have no doubt I had; I have no doubt that I took in this letter and submitted it to him, and ascertained that he favored the idea, but I have no distinct recollection of it. The proof that he favored the idea is, that he recommended it to the Council.

By the Honorable Mr. Scott :—

Q. It is not a recommendation; he merely submitted it?—He would not have done so if he had not favored it to some extent. I certainly understood that the idea was favored by the Department, and I have no doubt at all that I said so to Mr. Rowan, and that he probably left very soon afterwards for Manitoba.

By the Honorable Mr. Macpherson :—

Q. The alterations which were then made, and which you recommended there, instead of costing $260,000, are now estimated to cost $930,000?—It would seem so, but I have had nothing to do with this particular matter from then until now.

Q. Who has had charge of it?—Mr. Smith has had charge of it in my absence, and has had charge of these returns.

Q. In reading Mr. Smith's evidence you will see that he knew nothing of this change, until he went up afterwards and found them at work?—He was in full charge of the Pacific Railway in my absence.

Q. How was it, when Mr. Smith was to succeed you, that he was not fully advised as to the change?—He had possession of every document in the department, and if he did not examine them it was not my fault.

Q. Don't you think that in transferring to him the management of the line, it was worth while notifying him that, you had recommended a change involving an increased expenditure of $260,000?—I took it for granted that he would have got, as I would myself have got, full instructions from the Department authorizing the change.

Q. He said that he had no information about it, and knew nothing about it until he was on the work?—My letter-book was lying open for him to read anything in it.

Q. Mr. Smith went up there, and he says, that when he found the change had been made, he telegraphed to Ottawa to ascertain what authority the contractors had for it, and was informed that it was ordered by you?—My recommendation did not authorize the change. I could not have written any letter of authority. Mr. Smith must have been mistaken, or the party who gave him that information must have been mistaken, because I had no power to authorize the change, either orally or in writing.

Q. Have you investigated the cause of the cost exceeding so much what you supposed it would, when you recommended the change?—To some extent I have. I have made some calculations, but not exactly on that point.

Q. What other calculations have you made?—It will probably come out by-and-by; I don't wish to volunteer anything.

Q. You have not investigated the causes of the cost exceeding the estimate on which you based your recommendation?—I have not.

Q. If a correct estimate of the additional cost had been placed before you, showing what it has proved to be, do you think that you would have recommended it?—These things are not done on the spur of the moment. I am not prepared to answer that question just now. It is very likely that I would, but I am not prepared to say positively that I would.

Q. It is a change in the character of the work altogether?—Yes.

Q. Changing your entire plan?—I know if the same facts were laid before me again as were submitted to me on the 22nd of May, 1878, I would make the same recommendation. I think it was a very proper thing to do.

Q. The conclusion being an increase of $260,000, that you would recommend it again?—Certainly, I would.

Q. But it has come up to a million of dollars, in round figures?—I have no doubt whatever that it is a wise thing to do, whatever the cost.

Q. I asked you yesterday if you could give us the cost of the survey of the route between Lake Superior and the Red River?—It would be rather difficult to get at, because the accounts are not classified in such a way that you could obtain it by simple inspection of the books.

By the Honorable Mr. Scott:—

Q. Was it for the purpose of ascertaining how cheaply the work could be done, with a view to getting it done in the most economical manner, that tenders were called for three times? The two preceding ones were not let, because it was feared that the prices were too high?—I have already explained that on the tendering the cost seemed to be so great, that the Minister was anxious to see whether it could not be done cheaper.

By the Honorable Mr. Macpherson:—

Q. And the change was to a more expensive mode, on your recommendation?—The change seems to have been made irregularly if there has been no Order in Council.

By the Honorable Mr. McLelan:—

Q. The second tenders were called for on what was considered a cheaper plan?—Yes. It was considered important to get as much work done as possible from the two ends, from Lake Superior and Red River; and I suggested to the Minister to get the heavy rock work done on section 15, leaving the trestle-work over until it was wanted. I think I was right in making that suggestion. It is now three years since it was commenced, and sections "A" and "B" will not be completed for three years to come.

Q. In the second tendering the embankments were all made, leaving out the trestle-work, I think, very properly; then in the third, the trestle-work is added. Why was this done?—I cannot answer that except by theory; and my theory is this, that the Minister and the Government felt the importance of getting the line completed to Rat Portage as soon as possible, that they decided to put not only the trestle-work but also the track-laying and ballasting under contract, so as to get so much nearer the interior of the country.

By the Honorable Mr. Macpherson:—

Q. And was the reason for adopting the trestle-work to diminish the cost as much as possible for the time being?—I cannot give you a very satisfactory answer because I was not here. I cannot give other people's reasons.

Q. But the policy was settled before you left?—The object of the trestle-work was to get communication as soon as possible.

Q. Could not the grading have been done more economically after communication was established by trestle-work than without it?—It appears not from the report of Mr. Rowan.

Q. You have had some experience, what is your own opinion upon that question?—My opinion varies; because, in a case like the Intercolonial Railway, I think it is advisable to make the work as permanent as possible. In this case the circumstances are different. It is important to get a line of steam communication of any description, as soon as possible.

Q. Could not the earth-work have been completed more economically, after the track was laid, and when the work could be done by locomotive, than before?—It is a matter of calculation. I really could not say.

Q. You say that the object was to get a communication through as early, as rapidly, and as cheaply as possible?—Yes.

Q. Then why was the whole policy changed, and one of a permanent road adopted?—From what I have just learned it has not been officially changed. I simply recommended a change. I said that the additional cost would only be the small sum of $260,000, and recommended that the change be carried out.

Q. That has run up now to nearly a million dollars?—It has exceeded the estimate considerably, I know.

By the Honorable Mr. Penny:—

Q. You left in May, shortly after that letter was written, but at that time the third contract was being proceeded with?—Yes.

Q. So that you were here when the third contract was let?—No; I was away the previous year as well.

By the Honorable Mr. Macpherson:—

Q. You reviewed all that had been done, I presume, during your absence?—Yes.

By the Honorable Mr. Penny:

Q. Who was in charge when the third contract was let?—Mr. Smith. He was acting Engineer-in-Chief during my absence.

Q. On both occasions?—Yes.

By the Honorable Mr. Macpherson:—

Q. Were you ever upon the section?—I have never been on the work; but I will have to be pretty soon.

By the Honorable Mr. Scott:—

Q. Has the work been done as cheaply as it would be under any other circumstances?—I felt it my duty to enquire into that as soon as I knew the work was increased. I have in my hand a calculation which satisfies me, that the public did not lose much by the change from trestle work to permanent embankments, under the present contract with Mr. Whitehead. Before I read the results of this calculation, it is proper that I should explain that Mr. Whitehead undertook to do the work without any charge for hauling. In the other tenders, hauling was to be paid for, and unless they

consented to do the same as Mr. Whitehead, the hauling would have to be paid for in consequence, it would, it is proper to include hauling in the other cases. In one tender, the party tendering undertook to do the clearing for 20 cents an acre, which was manifestly a mistake and would have to be corrected. I suppose that he meant $20 per acre, and I have taken the liberty of making that correction.

Q. What is the average?—Some are as high as $30. On these data I find that the five lowest tenders stand as follows:

1. Sutton, Thompson & Whitehead	$2,515,917
2. John A. Green & Co	2,525,325
3. Talbot & Jones	2,734,377
4. D. Hinkson	2,518,311
5. A. Farewell	2,560,389

These are the five lowest tenders, the increased quantities being moneyed out of the rates in each. Some of them come very close to the tender of Sutton, Thompson & Whitehead, but none of them under it.

By the Honorable Mr. McLelan:—

Q. Those are all tenders made under exactly the same conditions of knowledge of the work to be done?—Yes.

Q. Now, in the first letting there was a very different specification. Will you give us the prices for rock and earth on some of the low tenders? What was the quantity of rock that was submitted to the contractors?—If this document is right it is 600,000 yards.

Q. Will you name some of the prices for executing it?—I don't know anything about the paper which you have handed to me. I cannot give it as my evidence.

Q. I find that the tenders for executing that work range from $1.04 to $2.75. There were twelve tenders lower than the one actually accepted?—This is a piece of information that may not be of any value whatever. As I said before, when my attention was directed to the fact that the quantities had greatly increased, I at once made a calculation to ascertain if the public interests were in any way interfered with, and found exactly what I have explained to you—that, taking the first five lowest tenders on section 15, Sutton, Thompson & Whitehead were still the lowest.

Q. This is spoken of as Mr. Whitehead's contract; it is not his own tender, is it?—This is a tender sent in by some persons named Sutton, Thompson, & Whitehead; whether Mr. Whitehead had anything to do with the original tender or not, I do not know.

Q. Who do you imagine is the manager of the contract?- I believe that Mr. Whitehead is substantially the contractor.

Q. I believe that he had a tender in in his own name at this letting?—Yes, Mr. Whitehead's tender was very much higher than Sutton, Thompson & Whitehead.

Q. What is the difference?—Sutton, Thompson & Co., $1,594,085; Joseph Whitehead, $1,899,790.

Q. Then, he having tendered at this large sum, he is now substantially the contractor, at this smaller figure?—It would seem so.

Q. I notice in that blue book of section 15, page 41, you refer to the price of cross-ties as being high; in what sense do you use that word?—High priced, I imagine.

Q. Do you mean in proportion to the price of ties on other contracts?—In proportion to the usual price for ties.

Q. That is the sense you consider it in; not as being inconsistent with the other prices?—Possibly I had reference also to the very considerable amount of money the whole would come to. I see that the reference is to destruction by fire, and it is simply a letter to the Department reminding them that it would be expedient to have the property secured. The ties might all be burnt up, and who would replace them?

By the Honorable Mr. Penny:—

Q. It may mean, I suppose, that there is a large amount of property at stake, and it had better be insured?—Perhaps so.

By the Honorable Mr. Macpherson:—

Q. Do you mean insurance?—I mean this, I read the letter itself, "this being the first certificate, and for the delivery of cross-ties, for which the schedule price is high, I would suggest that the department should be satisfied that the security for the due fulfilment of the contract is ample. This is the more necessary as the ties are perishable, and may at any moment be destroyed by fire."

Q. Yes, but you did not intend the suggestion to insure?—I may not have intended it in that light.

Q. Do the Government ever insure such property?—They endeavor to guard against loss in some way.

By the Honorable Mr. McLelan:—

Q. Were the schedule prices of Sutton, Thompson & Co. consistent, one with the other?—No, they were not very consistent. For instance, the prices of ties are very high in proportion to the prices of other work.

Q. How is the other wood work generally. Trestle work, how is that?—Low, and I think the rock-work is high, and the earth is a good round price too.

Q. And the tunnelling, what about that?—It does not come to much money. The tunnels are short and few on that section. The tunnels are low. Although I say that some of these prices are high and some low, on reference to the other tenders I find that there is not such a difference. For instance, take the rock-work. Whitehead's tender was $2.75, the next was $2.65, the next $2.50, the next $2.75, and the fifth $2.75. Then, with regard to earth, Whitehead's figure was 37 cents; that is high. In the second lowest tender it was 35; in the third, 40; in the fourth, 30, and in the fifth, 30.

Q. These tenders from which you have been quoting were in the aggregate higher than the one accepted?—Yes.

Q. Then the difference must have been in the additional cost which they put on the wood-work?—Wood-work and other items. The difference between the tenders is found by taking the whole together.

Q. If the prices for earth and rock-work were about the same in these tenders, the difference must have been made up on some other items?—Yes.

Q. But the principal items are the rock, earth and timber?—Well, there are the ties. For instance, some put in 50 cents for ties, others 30 cents, others 27. Then, in ballasting, there is a wide difference, 33, 38, 75 cents, etc. Then, in track-laying, there was a wide difference too, $290.00, $300.00, $400.00, $375.00, etc.

Q. But there is not a difference to make the large sum between Mr. Whitehead's own tender and that he is working on?—Yes; that is the way the difference is made.

Q. I am speaking of the original quantities. If the prices in all these tenders were substantially the same on rock and earth, and the lowest was taken, you must have taken the lowest on wood?—No; we took the lowest on the aggregate as estimated.

Q. If the prices were substantially the same on rock and earth, then, to make that the lowest tender in the aggregate, the price must be lower on trestle-work?—Or something else, of course.

By the Honorable Mr. Macpherson:—

Q. The timber and trestle-work formed the next most important item?—No; ballasting and track-laying.

By the Honorable Mr. McLelan:—

Q. What was the original estimate for the trestle-work, moneyed out at Sutton & Thompson's prices?—I think it is $360,000.

Q. Then the trestle-work was a large item?—Yes.

Q. So that then it would work out that the difference in the price on the original tender was largely on the trestle-work, that is if the earth-work and rock-work were originally the same?—I do not see what you are aiming at. I shall be most happy to furnish all the information in my power, but the questions put are puzzling. I do not comprehend them or their object. The items are moneyed out at tender rates, and come to the figures that I have repeated over and over again.

Q. These other parties tendered higher on trestle-work than Sutton & Thompson did?—I cannot tell you without looking into it. Some are higher and some are not higher. Tender No. 3 was the same price as Sutton & Thompson's—30 cents; another was 50 cents, and another 45.

Q. I understood you to say that from the calculations you made these four or five tenders are equally consistent?—They are equally inconsistent.

Q. My point was that Sutton & Thompson were still more inconsistent; lower on the trestle-work than the others?—No; it seems not. There is one tender in which the price of timber is as low as theirs. For one kind of timber Talbot & Jones are two cents higher; for another kind five cents lower; for another kind Whitehead's tender is 25 cents, while Talbot & Jones' is 15 cents.

COMMITTEE ROOM,
Friday, 18th April, 1879.

Mr. SANDFORD FLEMING recalled and further examined:

By the Honorable Mr. Macpherson:—

Q. You were particular in saying, and repeated several times, that the estimates on which the tenders were based were merely for the purpose of comparing tenders, and that only; that they did not profess to be exact estimates of the quantities?—Yes, sir; that was the immediate object.

Q. Did you report that to the Minister?—I saw no necessity for reporting it.

Q. Do you think that the Minister was aware that they were not supposed to convey a correct idea of the quantities to be executed?—I cannot tell you; he may or he may not.

Q. Did you not bring it under his notice?—That was some time ago. I cannot remember everything that transpired years ago; it is impossible. Anything official that I may have done is on record. Anything that I may have said, or any opinion that I may have expressed officially, is on record in the Department.

Q. Would not anyone looking at those estimates suppose that they were intended to represent the complete quantities?—They were considered sufficient for the immediate purpose and perhaps as near as we could at that time arrive at them.

Q. You have added up, have you not, the totals of these estimates?—Yes; that was in order to compare the tenders.

Q. The addition was not necessary, though?—It was quite necessary; we could not compare the relative value of the tenders without adding up the several amounts.

Q. Of course it will show the totals of the tenders; would that afford any accurate ground for comparison?—Yes.

Q. Would they afford ground for accurate comparison when it was known by you that these were really not approximate, and that the contractors were to be paid for the full amount executed by them?—It was known not only by me, but by everyone who had anything to do with it.

Q. What was?—That these quantities were only rough approximations. If we could have given accurate quantities we would gladly have done so, but we had not the means.

Q. But when the contractors were to be paid for the amount of work actually to be done without any reference to the totals of the estimates, how could the totals of the estimates be a fair ground for comparison?—It was a perfectly fair means of comparing the tenders.

Q. Did you not say that the totals afforded a fair ground of comparison?—I did, and I do so now.

Q. Would not a comparison of the rates for the several items be a much fairer means of comparison?—No; that would not give you a comparison at all; not a fair comparison. It would lead to all sorts of complications, difficulties and misconceptions.

Q. Did I understand you to say, that when the contractors were to be paid for all the work that they did, the prices they put on the items would not afford the best means of comparison?—They would, if you moneyed out each item by each separate rate and then added all together. If there was only one item in the tender you would not have to do that.

Q. Would not that be the case if the parties tendering were bound to complete the work for the gross amount for which they tendered?—I do not comprehend that question.

Q. There are two modes of tendering; one in which the contractor binds himself to complete the work for an amount which he names; but when, as in this instance, the contractor was to be paid for whatever work was done without reference to the quantities in the schedule, I ask if the rates for the items would not afford the best means of comparison?—I cannot agree with you that if the contractors were to be paid a lump sum it would be a fair comparison. I think it would be a most unfair way, and my reasons for saying so were given in reports, which I submitted to the Government when I was Chief Engineer on the Intercolonial Railway, and the result of the contract system on the Intercolonial Railway has confirmed all that I then said.

By the Honorable Mr. Scott:—

Q. Perhaps you would illustrate that?—It is too long a matter; I can send for the printed reports.

By the Honorable Mr. Penny:—

Q. Perhaps you can tell us whether contracts on the Intercolonial Railway were very much below the cost of the work?—In some cases they were.

Q. Can you mention any of them?—Well, nearly all of them.

By the Honorable Mr. Macpherson:—

Q. Were they below their cost?—Below their value.

Q. What do you mean by that; below the sums actually paid?—Below what the work could be done for with a fair profit or without loss to the contractor or the contractor's friends.

By the Honorable Mr. Penny:—

Q. As a fact, did the cost exceed, in many cases, the contract price?—Yes; the cost in many cases exceeded the contract.

By the Honorable Mr. Macpherson:—

Q. Were there any suits brought by contractors against the Government, and did the Court not hold that they could not recover?—Some of them recovered.

Q. Did they not fail to recover?—Some of them failed, and some of them did not, and I imagine more will recover before all is done.

By the Honorable Mr. Scott:—

Q. Have you got your original estimates on the Intercolonial Railway up to the time the work was completed?—I dare say they exist, but I cannot tell where at present. All I can say is that I know no better way of comparing tenders, under the circumstances, than the one we have adopted on the Pacific Railway.

By the Honorable Mr. McLelan:—

Q. Was there any discussion between you and the Government, as to the mode of letting on the Pacific Railway?—There was no discussion; it was admitted by all that the plan adopted was the correct one.

By the Honorable Mr. Macpherson :—

Q. I will ask you again if, under the system adopted, especially when the quantities stated were merely for the purpose of comparing tenders, whether the rates for items did not form the best and only true basis of comparison ?—I cannot conceive how you could compare them, without moneying them out.

Q. But it is in moneying them out, is it not, and in adding the totals together, that you have a proper ground for comparison ?—You could not compare them at all without adding the several amounts, unless the items were very few in number. If there was one item only it could, of course, be done.

Q. In such a case as the very one under consideration where the quantities were very much changed, would not the rates be a fair ground for comparison, and the only true ground ?—If you money them out it would, but in no other way. I cannot conceive how you would compare a large number of tenders, possibly 60 or 70, each embracing, say thirty different items, all at different prices, unless you moneyed them out in the way described.

Q. You would compare each item, and not the amount of the whole ?—My answer is this : if you were letting each item separately you are perfectly correct ; but if you let a number of items to one contractor, at various prices, there is no other way of comparing the tenders as they are received.

Q. Do you mean the aggregate of each item ?—There cannot be an aggregate of each item ; there can only be an aggregate of the whole.

Q. You mean each item ?—I mean the total sum of the whole of the smaller sums.

Q. Yes ; but if the quantities are changed, as they were in this case, how would the total afford a true basis of comparison ?—The best proof that they did afford a true basis, is the fact, that notwithstanding the great change on some sections, the contract accepted is still the lowest.

Q. Did that necessarily follow, or was it it an accident ?—It is proof that the system adopted is a good one. I admit that there is a possibility of it turning out another way, but, in this case, it has not turned out so, and if any gentleman inside or outside of this room could point out any better way of comparing tenders, I should be very much obliged to him.

Q. When the quantities are quite indefinite I think the only way to compare the tenders is to compare the rates for items in each ?—It is impracticable. In answer to the question I simply give my opinion for what it is worth. I hold that the plan suggested for comparing tenders is utterly impracticable.

Q. I understood you to admit, just now, that it might be the correct way ?—I do not admit it to be the correct way ; I do not see how it could accomplish the object at all, unless you had only one kind of work to place under contract.

Q. What was the great advantage in making a minute survey. Would it not have been as well to have put down arbitrary quantities ?—No ; the minute surveys were made for another purpose ; it was for the purpose of getting the best line possible in the country, with the most favorable gradients.

Q. Had that been done when the work was let on this section ?—It had not been fully done ; it has been done since.

Q. I asked you the last day you were here, if you could ascertain what the survey had cost ?—The book-keeper is here, and he could inform you better on that point than I can.

By the Honorable Mr. Christie :—

Q. Has the practice in this instance differed from the practice in the case of the Intercolonial Railway ?—Yes.

Q. In what respect ?—Because the contracts were let on the lump sum system there.

By the Honorable Mr. Scott :—

Q. I want a few noted cases in which the work really cost very much in excess of the bulk sum to which contracts on the Intercolonial were originally supposed to be limited, and the cost of that increase ?—I can give the original contract sum, and

the amounts paid, but I cannot give you what the work will cost when it is all done, because the claims of the contractors are not all finally settled.

By the Honorable Mr. Haythorne :—

Q. In consequence of the incompleteness of those surveys, have the Government more work to pay for, than they anticipated—for instance, on the section under consideration?—They had more to pay than may have at first appeared.

Q. Has not the result proved that the Government have actually lost nothing? —As far as I have looked into the matter the result has proved that the Government has lost nothing by letting the work to these particular contractors.

By the Honorable Mr. Macpherson :—

Q. Have you informed yourself as to whether there was any change of the work authorized by the Government on section 15?—Yes; I have informed myself, and I find that no change has been authorized by the Government.

Q. Can you tell us how the change was made?—I cannot tell you in any other way than I did the other day.

By the Honorable Mr. McLelan :—

Q. Were there two or more locations under consideration as a terminus for the Pacific Railway; at Nipegon or any other point?—I do not know what you mean.

Q. Before you settled upon a terminus at Lake Superior, were there not other routes projected?—There were a number of routes. Our surveys extended over a breadth of country of 100 miles, probably in order to find out where we ought to go.

Q. Did the question of cost enter into consideration?—Our primiary object was to find a practicable route. The country was by some deemed impracticable for a railway; in fact we knew next to nothing about the country; it was absolutely unexplored until we began to look for a route.

Q. Did you make any estimate as to the cost of the separate lines?—There were no calculations made; we judged by inspection of the profiles and plans which route was the easiest; there were no calculations of the quantities or cost—no quantities were taken out, and no comparison of the cost of the several routes was made.

By the Honorable Mr. Penny :—

Q. Still you formed an idea of which would be the most expensive route?—Yes

By the Honorable Mr. Scott :—

Q. Which was adopted; the more expensive, or the other?—Of course, we adopted the one that we considered the least expensive and the most eligible.

By the Honorable Mr. Macpherson :—

Q. Have you made recently an estimate of the cost of the line from Lake Superior to Red River, as finished?—I have.

Q. What do you estimate it at?—I furnished an estimate to the Minister; it is confidential, and I do not know that I am at liberty to give it. With his permission I shall be most happy to give it.

By the Honorable Mr. Haythorne :—

Q. You have the bill of works before you of section 15?—Yes; the quantities in this bill are furnished for the purpose of giving an approximate idea of the nature and magnitude of the contract, to admit of a comparison of tenders.

By the Honorable Mr. Macpherson :—

Q. Were the estimates, then, not intended to indicate the cost of the work when completed?—They were intended exactly for what this printed paper, exhibited at the time, sets forth; "to give the intending contractor an approximate idea of the nature and magnitude of the work, and also for the purpose of admitting of a comparison of tenders."

Q. And were they not intended to convey to the Minister, to Parliament, and to the country the approximate cost of the work?—They may have done so, but that was not their immediate object. Another clause in the printed paper says: "The

"contractors may be required to perform at the same prices other works connected "with the grading of this section, the precise nature and position of which cannot at "present be defined. The right to vary the location of the line is reserved, and such "alteration shall not invalidate the contract. The quantities of the work shall here- "after be correctly ascertained and paid for according to the schedule of prices in the "tender which may be accepted."

By the Honorable Mr. McLelan :—

Q. Would it have been a proper thing for a public man in speaking inside or outside of Parliament to have taken the figures of the accepted tender, as the cost of the work when completed ?—I can hardly say; I am quite sure it would not cover anything like the full cost of the work. There are the rails, rolling stock, stations, etc., to be added.

Q. I mean as to the grading ?—It might have lead to the formation of some rough estimate on the subject, but that would be all. I should explain that there was no design to have those quantities very wide of the mark. The idea was to have them approximately, as near as possible, but we had no means of making them accurate.

By the Honorable Mr. Haythorne :—

Q. Might not the same system lead to the opposite result in another section ? Might not the estimate be less than the actual cost of the work ?—Yes; in my experience the first rough estimates have, in some cases, exceeded the actual measured quantities of the work in execution. It happens, unfortunately, in three of the cases under discussion here, that the revised quantities have largely exceeded the first rough estimates. I have said more than once that the excess has turned out a good deal greater than I myself expected it would.

Q. What time do you suppose it would have occupied you to have made an exact survey, which would have enabled you to let the work with precision ?—I doubt if it could be done in a couple of years.

By the Honorable Mr. Macpherson :—

Q. How long was the survey in progress before the work was let ?—The surveys began in 1871, and they are not finished yet.

Q. Do you mean on the section under discussion ?—They are practically finished on the sections between Fort William and Red River, but we are still going on improving the location on the contracts recently let. There are several portions of Section B, which was let the other day, where changes, and I trust improvements, will be made.

By the Honorable Mr. Christie :—

Q. So that, were the letting of the tenders delayed until the completion of the survey, it might involve a delay of several years ?—In a country like this, it might have involved serious delay.

Q. As the result has proved ?—Yes.

By the Honorable Mr. Scott :—

Q. Was the contract let the other day on the same principle ?—Precisely.

By the Honorable Mr. Macpherson :—

Q. Were not the surveys further advanced so as to give a more accurate idea of the quantities ?—They were; but there is no certainty whether, that the work when executed, will measure exactly the same as the present estimate of the quantities.

By the Honorable Mr. McLelan :—

Q. You do not anticipate so large an increase as on Section 15 ?—I hope there will be a decrease.

By the Honorable Mr. Macpherson :—

Q. Are we to understand that the contracts which are now the subject of this enquiry, were let before the survey was sufficiently advanced to allow you to take out the accurate quantities ?—They were.

By the Honorable Mr. Scott :—

Q. Can you tell us how long the surveys have been going on, on this particular section before the contract was let?—We began the surveys in the spring of 1871, and these contracts were let as follow :—

Contract	13	April 3rd, 1875.
do	14	do
do	15	Jan. 9th, 1877.
do	25	June 7th, 1876.

Q. And the surveys have been going on since when?—From the spring of 1871, but the Committee must bear in mind that those surveys were diffused over a very wide area, from Thunder Bay to the north side of Lake Nipigon—a breadth of country of nearly 150 miles. We ran lines in all conceivable directions through that breadth of country in order to find out where we ought to go.

By the Honorable Mr. McLelan :—

Q. By one party?—By many parties; of course, not all at the same time, or the same year, because that would be a needless expense. When we found we could not get a line by a certain route one year, we tried another route the next year. We sent out the first year parties to endeavor to find a line on what seemed to be the most desirable route—for instance, by way of Sturgeon Falls. I know that was done one year, though it may not have been the first year. Having failed to find a route there, we tried the following year another route, and I need hardly say we made many failures in our attempt to get through.

By the Honorable Mr. Macpherson :—

Q. Was the survey of the section between Lake Superior and Red River going on from the spring of 1871?—Yes; surveys in that region were going on.

By the Honorable Mr. Scott :—

Q. What is the distance from Thunder Bay to Lake Nipigon?—The breadth of country is nearly 150 miles.

Q. Thunder Bay is not assumed to be the nearest water point?—It is the nearest to Red River. I mention Thunder Bay simply because the railway under construction terminates there.

Q. What I mean is, going east from Red River, is Thunder Bay the nearest navigable water?—Yes; I believe so. I think I was examined pretty fully on that point last year.

By the Honorable Mr. Macpherson :—

Q. Was the Minister informed of all you were doing in the way of survey?—Not all; but as far as we could. The Minister is occasionally difficult of access; sometimes it is almost impossible to see him on anything but very pressing business. I made an estimate of the number of miles we surveyed altogether in 1877, and then I estimated that we had measured and levelled over, yard by yard, 11,500 miles, not in that immediate locality, but on the whole route, and we had explored 46,000 miles up to the end of 1876, that was done chiefly in the wood and mountain districts. There was not so much on the plain.

By the Honorable Mr. McLelan :—

Q. Was this Thunder Bay line adopted on your recommendation?—I think so.

By the Honorable Mr. Penny :—

Q. You are quite sure Mr. Mackenzie did not run a line for himself?—He did not. I don't know that I recommended any line very strongly; but when my opinion was asked I was always very happy to give it for what it was worth.

Q. There was no difference of opinion between you and the Minister?—None of any importance.

By the Honorable Mr. Scott :—

Q. Have you any doubt now as to which was the better line to adopt—to Nipigon or to Thunder Bay ?—I have no doubt whatever as to the point of the navigation of Lake Superior that is nearest to Red River, and that was the great object in running the first line.

Q. Can you tell what the difference in cost would be if you went to Lake Nipigon ?—We never made a sufficiently accurate survey to Nipigon. It is not fair to ask one in my position to make estimates such as you enquire for, without proper data. If we make a guess those rough guesses are taken and sometimes referred to as accurate estimates.

Q. Would not the line to Nipigon have been very much more expensive ?—I have not the means of making a calculation.

Q. I mean the distance on the map is greater ?—I cannot tell you. It is hardly fair to drive an engineer to express an opinion as to measurements, or of quantities when he has no data at hand.

SANDFORD FLEMING.

FREDRICK BRAUN, Secretary, Department of Public Works, called and sworn, was examined as follows :—

By the Honorable Mr. Macpherson :—

Q. You are subpœned to bring with you copies of all reports from the Minister of Public Works to the Privy Council on the changes recommended by the engineers to be made in the contract for section No. 15, of the Canadian Pacific Railway, and also of all correspondence on the said subject, *written* or *telegraphic*, between the Department or any officer of the Department and the Engineers' Department, or any officer thereof. Have you brought them ?—I have. In accordance with your request search was made in the books of the Department for the reports called for, and the only one entered is this which I now hand to you, marked Exhibit F.

Q. Is this the document referred to in that exhibit—Exhibit D ?—Without having compared it I would say that this is a copy of the report mentioned in the document I have handed you. It has been copied in the office. There is Mr. Whitehead's proposal, Mr. Rowan's report to the Chief Engineer, and the Chief Engineer's report. They are fastened together, and marked Exhibit D.

Q. And is there no other correspondence ?—There has been no other correspondence.

Q. Is there no correspondence with Marcus Smith ?—Not that I could find in the records.

Q. Have you no telegraphic communication from Marcus Smith sent from section 15, inquiring by whose authority the change in the construction of the work was made ?—There is no entry of such telegraphic despatch in our books, nor any reply.

By the Honorable Mr. Scott :—

Q. Is there any order of any kind authorizing the change ?—No, nothing further than this report, Exhibit D, submitted to Council.

Q. When the Minister approves of a work and recommends it to Council, is that the form the minute takes in your Department ?—No, this is a mere submission. In cases where a recommendation is made it is specifically stated. The wording is either "requests authority to authorize the work," or "he recommends." In this case he "submits."

Q. Was any action taken on this ?—I am not aware of any. That is the last I have seen of it.

Q. When action is taken on such papers by the Council is there any record of it ?—We receive a copy of the order. In this case no Order in Council was received in the office.

By the Honorable Mr. Penny :—

Q. How long have you been in the Department?—Since 1860.

Q. Were you there when these buildings were put up?—No; I came from Quebec in 1865.

Q. Can you tell us how much more they cost than the original estimate?—I think the estimate was something like $900,000.

Q. What was the actual cost? $3,000,000?—About that, including furniture, fittings, &c.

By the Honorable Mr. Macpherson :—

Q. Are you aware whether we drifted into an expenditure of an additional million dollars in the construction of these buildings without any authority from the Minister or any kind of authority?—I am not competent to give an opinion on the subject.

Q. Can not you tell us when it became known in the Department that this change in the contract No. 15 had taken place?—I could not say. These matters could take place without our knowledge.

Q. Could you tell us when the fact of the change first became known in the Department?—I do not think that the knowledge of it came to me before I was summoned to produce report and Exhibit D, 22nd May, 1878.

By the Honorable Mr. Scott :—

Q. The change had not taken place then?—No, not to my knowledge; and I am not aware that it has taken place.

By the Honorable Mr. Penny :—

Q. When were you aware that the change took place?—Officially, I am not aware of it yet. There is nothing in the Department to indicate it.

By the Honorable Mr. Scott :—

Q. Have you searched for the communication from Mr. Smith and the answer he received?—I did not, further than the search that was made to comply with the demand of the Committee.

Q. Will you look for it?—I will.

Q. Is it likely that a document of that kind would be destroyed?—But even if it were, the books would not be destroyed, and the entry would be made.

By the Honorable Mr. McLelan :—

Q. I understood you to say that no official action had ever been taken on this matter?—No.

Q. Was it usual for matters so important as this to remain in abeyance so long?—That is a matter that rests with the Privy Council, who may have reasons for deferring action.

By the Honorable Mr. Scott :—

Q. Any action of this kind must be taken either through the Minister, or the Deputy Minister—any action so important as this?—I think it would require an Order in Council.

James Baine, Accountant, Department of Public Works, called and sworn, was examined as follows :—

By the Honorable Mr. Macpherson :—

Q. You were asked to bring with you a list of the names of all persons employed on the Canadian Pacific Railway Survey, between Lake Superior and Red River, with a memo., detailing the duties which were assigned to them, the time for which each was employed, and the amount paid?—I only took charge of the survey-books in 1877.

Q. But, will not the books anterior to that show the whole cost of the survey?—I suppose they will; I did not keep the books.

Q. But the books are there, and you will be able to extract the information?—I would not be able to undertake it myself.

Q. What the Committee really wants is the cost of the survey between Fort William and the Red River?—I think an approximate estimate of it may be got.

Q. Do you know what the gross cost has been?—We might get it from the books.

Q. Have you kept the expenditure in each division separately?—I have, from the 1st July, 1877.

Q. And how was it kept before that?—Mr. Redford was employed.

Q. But it is all entered, is it not?—I suppose it is all entered in the books that Mr. Redford kept.

Q. Is he here still?—No; he is in Montreal, I believe.

J. BAINE.

COMMITTEE ROOM,
21st April, 1879.

The Hon. Mr. MACKENZIE was called, sworn and examined:—

By the Honorable Mr. Scott:—

Q. Can you explain to us how this change in Mr. Whitehead's contract occurred?—Not having the official papers I must give the statement irrespective of exact dates. In the first place the change originated, I think, in a letter sent by the contractor, which was referred to the engineers. I think in that letter, or in the engineers' report, the additional expenditure was represented as being about $260,000. It was during the sitting of Parliament that the Department had that under consideration. Mr. Fleming strongly recommended it both in his report and in verbal conversations, and I had no doubt, personally, it would be an immense advantage to the work, and, so far as that was concerned, that is in an engineering point of view, I entirely approved of Mr. Fleming's recommendation. My reasons for it were these: in the first place section 15 proved to be the most expensive part of the entire road, to the Pacific almost, so far as we knew, and the first tenders that were received, I think, were nearly double those that were afterwards acted upon, as those tenders were based upon a different kind of work and probably a different formation level. In order to get it done cheaper we determined to do a good deal of the section with trestle-work of timber instead of embankment, and the consideration that I had personally, as Minister of Public Works, before me, was whether it would be advisable to incur the additional expense then, or let the road go into operation upon the plan upon which the contract was given out, and fill in with earth at our leisure. One reason for doing it immediately was the possibility of forest fires destroying the trestle-work within a very short time; and, in any case, we could only count upon trestle-work made of the timber of that quarter lasting ten, twelve, or fourteen years. That was the opinion of the engineers. On the other hand, we felt exceedingly loth at the time when we were endeavoring to economize as much as possible in every way to incur the additional expense of $258,000 or $260,000. We deferred the Governmental consideration of it until after the session. It was then sent to the council by myself with this formal report, merely to bring it under consideration. The Committee will observe, I did not in any way recommend this, or send it to the Council with a desire that it should be carried through, but merely for discussion, and at the time it was sent to the Council it was with myself almost an even question whether it ought, or ought not to be done. There would be an immense immediate advantage, I have no doubt, but there would be a disadvantage in having to spend so large a sum of money more than was necessary to get us to the prairie country, which was our immediate object. It was discussed in Council, and towards midsummer we finally determined not to do it. I had given no orders that I am aware of, and I am pretty sure I did not in any way sanction the change; and no one was more astonished than I was, when I found out after the

House met this Session that the work had been proceeded with upon Mr. Fleming's recommendation. I was so much surprised, that I wrote a letter to the Deputy Minister of Public Works, asking if it was possible that any Order had passed, as I thought it possible an Order might have been passed in my absence. I found I was correct in my anticipation that no orders had been given. I wish the Committee, however, to understand that I entirely approve of Mr. Fleming's recommendation from the engineering point of view. But the question chiefly to be considered was the financial one. In other words, if the financial question had not been so serious, it is more than probable I would have entirely agreed with him. There was another matter that influenced me a good deal at the time. Messrs. Sutton, Thompson & Whitehead's prices were somewhat unequal—a high price for rock-work, a fair price for earth, and allow price for timber-work. In other words, their prices in that respect were different from some other prices, and until the Engineer would make up a statement, it might be questionable whether their tender would be the lowest, if the work were executed upon Mr. Fleming's new plan. I have no recollection of Mr. Fleming making such a statement, showing an analysis of the respective tenders, but he may have done so. But, if we had agreed to the recommendation of Mr. Rowan and himself, that would be an element of course to be considered. I cannot recollect whether Mr. Fleming did or did not give me a statement of that sort, but I think he did not.

Q. Mr. Fleming left a few days after that paper was prepared and went to England?—Yes; but we had it under consideration in the Department long before that; it was merely when it was sent for the consideration of the Council as a whole.

By the Honorable Mr. Penny:—

Q. You say you do not think Mr. Fleming made a statement as to the quantities under the new conditions, and how they would compare with the tender?—My impression is, that later in the season, during the summer, Mr. Trudeau and myself had a conversation on that point, and my recollection is, that an analysis, if made, would have shown that some other tenders would be either as low or lower, I think lower, than Whitehead's. Of this, however, I speak subject to correction, as my recollection is not very clear, but I think Mr. Trudeau will remember whether I am correct or not.

By the Honorable Mr. Macpherson:—

Q. Does the Committee understand you are right in saying you did not know of the change until after the meeting of Parliament this Session?—Yes.

Q. Did not Mr. Marcus Smith bring it under the notice of the Government?—He never brought it under my notice, and if he brought it under the notice of the Department, I was never advised of it. Official letters, as you are aware, are not opened by the Minister, but by the Secretary and the Deputy Minister.

Q. Were not frequent reports made from the works by the resident engineer?—There were the ordinary monthly estimate reports respecting small minor changes, such as shifting the line a few hundred yards to overcome unexpected obstacles, or better the line. Such changes were allowed, but such a change as this was never dreamed of.

Q. Had Mr. Whitehead an interview with you on the subject of the change?—I think he had with Mr. Trudeau and myself.

Q. Would he have left you under the impression that you were favorable to the change?—I do not think so. I never communicated my impressions to contractors.

Q. The object in determining upon constructing it first with trestle-work across ravines was for the purpose of getting through to the prairie country early?—Yes; and as cheaply as possible. The impression also was that once the contract was complete, the trestle-work might be filled up at our leisure, as they have done on the Great Western and other roads at less cost.

Q. The change of system, of course, put an end to that?—Of course.

Q. And rendered it necessary to incur the whole expenditure at once?—Yes; of course it would, if carried out throughout.

By the Honorable Mr. Penny :—

Q. Mr. Marcus Smith stated that when he got up there, he was quite surprised to find that the change had been made?—Yes; he was bound at once, on seeing such an important change to know the authority on which it was made, because before he left for the inspection of the railway, he had, as usual, very full conversations with myself, and he left with instructions to have the staff reduced where it was possible, and also with many other instructions that I can scarcely minimize in evidence further than to say that upon every conceivable subject we could think of about the works we had conferences—that is Mr. Smith, Mr. Trudeau and myself—so that he would go away fully informed on the views of the Government on the subject before leaving.

Q. So that even if he had such a letter as that sent to him by Mr. Fleming, it would not be sufficient authority to have the change made, and the work go on?—Certainly not.

Q. Did you discuss the change with him before he left?—No; we did not.

Q. Did you tell Mr. Smith that Mr Fleming had recommended the change very strongly?—No; he knew everything that had been done.

Q. He says in evidence that he did not?—I am very much surprised at that. It is almost inconceivable that he did not know, because the matters were talked of in the Department, and he was Acting Chief Engineer. It had been spoken of with Marcus Smith in the Department, during the winter.

Q. But you do not remember discussing it with him before he left?—We had at that time decided not to do it, and the intimation to him would have been of a positive and not of a negative character. If we had determined on having the change made he would have been so instructed.

Q. Mr. Fleming says he got the impression from you that you favored it?—From an engineering point of view I did, and I do now. I could not, however, authorize such a change to be made. It had to be done by the Government, as it was too serious a matter for the Minister of Public Works alone. I always placed implicit confidence in Mr. Fleming as an engineer, and I have no doubt in the world I expressed myself favorable to the change, provided the financial reasons did not stand in the way.

Q. At page 45 of the report of this Committee, you will find that Mr. Fleming says:—"I have no doubt that I took in this letter and submitted it to him, and ascertained that he favored the idea, but I have no distinct recollection of it. The proof that he favored the idea is that he recommended it to Council?"—I did not recommend it to the Council. I sent it to Council for consultation in the most formal manner, and I should think Mr. Fleming would very naturally state what he has stated. I certainly understood that the idea was favored by the Department, and I have no doubt we said so to Mr. Rowan. It was favored by every engineer in the Department from an engineering point of view, as it was favored by myself; but that was altogether apart from its execution at that time. My report to Council a few days after Mr. Fleming left was this:—

(Memorandum.)

(No. 9,172.—Subj. 961.—Ref. 15,748.)

DEPARTMENT OF PUBLIC WORKS,
OTTAWA, 12th June, 1878.

The undersigned submits the accompanying report of the Engineer-in-Chief of the Canadian Pacific Railway, upon the proposal of the contractor for Section No. 15 of that Railway, to complete the roadway with permanent rock and earth embankments throughout, in lieu of the wooden trestle-work originally proposed for portions of the line.

Respectfully submitted.

(Signed) A. MACKENZIE,
Minister of Public Works

A true copy.
(Signed) F. BRAUN,
Secretary.

If the Department had at that time decided to approve of it, I would have said in this order "which is submitted with the recommendation that the same be adopted."

By the Honorable Mr. Macpherson:—

Q. Do you remember whether you discussed with Mr. Fleming the probable correctness of Mr. Rowan's estimate?—I have no doubt I did. We discussed everything about it, and I have no doubt we discussed that point, although I have no distinct recollection of it.

Q. The actual quantities have exceeded the estimate enormously?—So I observe. Of course in matters of calculation of quantities I accepted the report of the Engineer in Chief, as the only authority upon which I could act.

Q. The previous tender for solid work, if it were carried out at the prices, would have amounted to more than Mr. Rowan's estimate of additional cost, plus Mr. Whitehead's contract?—I think so. That is my impression. I have a vague recollection of it, but I know it is very much higher.

Q. Did you get an estimate of the cost of the road from Lake Superior to Red River from Mr. Fleming?—Yes.

Q. Do you remember what it was?—I do not. There is always an estimate based upon the calculations as to quantities.

Q. Did you understand the estimate of quantities to be merely for the purpose of comparing tenders, or did you understand them to be approximate to the quantities to be executed?—I understood them to be almost exact estimates, and the first time that I found that the monthly estimates exceeded the total I immediately called the engineer's attention to it, and expressed my surprise when the work was so far from being finished that the quantities should have been reached.

By the Honorable Mr. McLelan:—

Q. Is that on this section or on other sections?—Chiefly on Section 14. This section was not far enough advanced to know whether the estimates would be exceeded or not.

By the Honorable Mr. Macpherson:—

Q. Did you discuss with Mr. Fleming the best system of having the work contracted for, whether by lump sum contracts, or the system that was adopted?—Yes we did. Mr. Fleming had a very strong opinion, as Chief Engineer, of the value of this particular mode of his, which had been departed from in the Intercolonial Railway to a great extent, and my impression is that he attributed some of the additional expenditure on that road to the departure from his own line. There was another reason given: this was an entirely new country—a very rough country naturally—and in some parts you passed over what appears to be a level tract of country covered with dense moss and shrubbery, and occasionally woods. An engineer surveying that country would very naturally assume that the material would be available for embankments, but when it came to be built it was found that a great deal of this material was very loose, and in some places four or five feet of moss and very loose earth where, it was supposed that earth or clay of some sort existed. I recollect they pointed out that it was almost impossible to get exact quantities in a country like that without an immense expenditure in sinking test-pits to ascertain the nature of the bottom in every place. The Government were desirous of building the initial portions of the road as soon as possible—that is, the section from Lake Superior to the prairie country, and as soon as it was possible to start from the Pacific eastward. I think in asking authority from Parliament to let the first tenders I explained our reasons for desiring to proceed with it as rapidly as possible, and Mr. Fleming's plan enabled us to do so, no doubt, a year earlier than we would otherwise have been able to do.

Q. The surveys were not sufficiently advanced?—They were sufficiently advanced to know the grades we could obtain and the quantities to be removed, but no survey except one of the most exhaustive kind would have enabled us to decide where morrasses existed and unusual obstacles which were not possible to be seen. For, instance, on

section 25 we found out before we had proceeded far with the contract that we could shorten the line by a mile and three-quarters by making a tunnel of five or six hundred feet through rock, and I had no hesitation in adopting it, although it increased the expenditure. A more exhaustive survey would have determined that in the first instance. There was always this to be said, that in any case if the other plan had been adopted—a very exhaustive survey made, test-pits sunk everywhere that would have developed more precisely the quantities we would have obtained in every case—the country has lost nothing in the adoption of this plan.

By the Honorable Mr. McLelan:—

Q. In this plan is it not essential to have the prices consistent one with the other?—It is better, certainly, but you scarcely ever get tenders in, where the prices are consistent. For instance, in the last two tenders accepted but a few weeks ago, the laying of a mile with cross timber in one of the tenders is $180; in another it was $1,450. In another item, iron piping, I notice is $4 per lineal foot and in the other it is $50. You will find in almost every one of the tenders received for public works some extraordinary discrepancy of that sort, that seems utterly unaccountable; but you can hardly say you should vitiate the entire tender if the total comes out rightly as being the lowest.

Q. But in this tender that you speak of, the price for timber not being consistent with the other items, the tunneling seems to be still more inconsistent; it is $100,000 below any other tender for section 15?—Yes; the tunneling is very low.

Q. You had doubts, you say, whether this was the lowest tender under the increased quantities that were proposed?—No; I did not say I had any doubt. It was a question I thought would likely have to be considered before assenting to the change. Personally I had no reason to believe it was so, because I had never gone into the calculation myself, and it would require very elaborate calculation to do so.

A. MACKENZIE.

MR. T. TRUDEAU, Deputy Minister of Public Works, called and sworn, was examined as follows:—

By the Honorable Mr. Scott:—

Q. Do you remember when this paper was prepared?—(Exhibit F) Yes.

Q. Do you recollect if any authority was ever given for making the change suggested or contemplated in that paper?—No authority was given.

Q. If the Minister favored the work and was disposed to recommend it, is that the sort of paper he would send to Council?—No; he would put in a clause recommending it.

Q. When did you first become aware that the change was made?—Since the opening of the Session.

By the Honorable Mr. Macpherson:—

Q. Had you any conversation with Mr. Fleming before he left for England?—Yes.

Q. Did you mention to Mr. Marcus Smith that Mr. Fleming recommended this change?—I do not recollect that I did particularly.

Q. So that as far as you know Mr. Smith left Ottawa without being aware of Mr. Fleming's recommendation in the matter?—It is very difficult for me to recall all my conversations with Mr. Smith, because I saw him every day, and had a great deal of conversation with him; but I am not aware of having specially spoken to him of this matter.

By the Honorable Mr. Haythorne:—

Q. You say you became acquainted with the change since the commencement of the Session; be kind enough to tell the committee in what way you first became cognizant of it?—It was by a note from Mr. Mackenzie, asking me about it.

By the Honorable Mr. McLelan:—

Q. Mr. Smith says when he went on the work he found it was then going on and he telegraphed to the Department. Did he communicate with you for the authority for this change?—No; Mr. Rowan telegraphed to Mr. Smellie, asking him for a copy of Mr. Whitehead's offer to do this work, with Mr. Fleming's report thereon, and Mr. Smellie sent him a copy.

By the Honorable Mr. Scott:—

Q. Have you seen that correspondence?—Yes.

Q. Is it in the office now?—It is not among the papers in charge of the Secretary of the Department of Public Works, it is in the Engineers office.

Q. Were you aware of it at the time?—I was not.

Q. You have learned of it since this enquiry commenced?—Yes; it was nothing more than a demand by Mr. Rowan for a copy of the offer made by Mr. Whitehead, and Mr. Fleming's report.

Q. Was it from Mr. Rowan or Mr. Smith?—It was from Mr. Rowan.

By the Honorable Mr. Penny:—

Q. What date was that telegram?—September.

By the Honorable Mr. Scott:—

Q. Were you aware at the time whether correspondence had been sent from Mr. Smith, or Mr. Rowan on the subject of this change?—I was not aware of it at the time; I learned it lately, since the enquiry commenced.

By the Honorable Mr. Cornwall:—

Q. Then, as far as your recollection goes, there was no telegram from Mr. Smith to the Department of Public Works?—No.

By the Honorable Mr. Scott:—

Q. Any communication from the Chief Engineer would have been registered when obtained?—It would.

Q. The answer would also be registered?—Yes.

Q. Would the Engineer be authorized to make so important a change as that, without the authority of the Minister?—No.

Q. Did the certificates that are issued by the Engineer for the progress estimates come under your observation?—No; not always.

By the Honorable Mr. McLelan:—

Q. Would an engineer, believing that the Minister favored the change, consider that sufficient authority to make it—would he be likely to?—He would not.

Q. Would he, from the custom of the Department, be likely to consider that the Minister favoring the change would be sufficient authority to make it?—He would not.

By the Honorable Mr. Macpherson:—

Q. Do the certificates that are granted by the Engineer for progress estimates come under your observation?—They do, if there is anything unusual in them; if the Engineer draws attention to the fact that it is an unusual certificate, it is brought under my notice.

Q. Are the quantities as executed checked with the original estimates on which the contract was based?—The resident Engineer on the works forwards monthly to the District Engineer a progress estimate; from him the estimate passes to the Chief Engineer, and the Chief Engineer, or his assistants go through it, and check it. The Engineer then delivers to the Secretary of the Department, a certificate that so much work has been executed under a certain contract, and that a certain sum of money is payable. From the Secretary the estimate goes to the Accountant. The Accountant simply brings to me a prepared form of certificate to the Finance Department, for the payment of the money. The details would only be brought under my notice in case the Engineer drew attention to something unusual.

Q. It would be the duty of the Accountant to draw your attention to it?—It would be the duty of the Engineer.

Q. And would it not also be the duty of the Financial Department to make enquiry if they found that the cost of the work was running up nearly to the estimate? For instance, in section 14, the total quantity of solid rock was estimated at 10,000 yards; according to the last return, dated 28th of February, the quantity of solid rock removed was 34,442; that was an excess of 24,442 yards. The original estimate for loose rock 3,000 yards, and the amount executed was 36,720 yards—33,720 yards more than was estimated. Would not that have attracted attention in the Department?—It would attract the attention of the Engineer. If the work is costing much more than was estimated it is the duty of the Engineer to report it to the Minister.

In the item of solid rock, the quantity was largely exceeded; in loose rock it was exceeded fifty per cent, and in earth there was nearly three times the quantity removed that was in the original estimate; should not that have attracted attention?—I have no doubt it did attract attention.

Q. Are the certificates issued monthly?—Yes.

By the Honorable Mr. McLelan:—

Q. And without the engineer calling attention specially to some item the certificates are paid without enquiry?—Yes; progress estimates.

Q. And so long as he goes on drawing certificates without calling attention to any item, they are paid?—That is a very broad statement.

Q. It is usually paid unless attention is directed to the certificate?—The original estimate of the cost of the work could not be greatly exceeded without attracting the attention of the Accountant, but we all know that the quantities submitted in the first estimates are only approximate. Some items are under and some are over, even in the best estimates.

By the Honorable Mr. Penny:—

Q. Is that the system that has prevailed for a long time in the Department?—It is.

By the Honorable Mr. McLelan:—

Q. On the Intercolonial Railway the total amount to be paid to the contractor was known, and you and the Accountant would not go beyond it?—That was under a Commission, and not under the Department of Public Works.

By the Honorable Mr. Macpherson:—

Q. The whole amount of money estimated for the removal of solid rock was $825,000, and the certificates paid up to the 28th of February were for $941,934; for loose rock the estimate was $52,500; amount paid $81,744; for earth excavation amount estimated, $29,600; amount executed, $82,993. Should not these great excesses have attracted attention when the certificates were issued monthly?—What I mean by stating that the Engineer should draw attention, is that he should make an official report if he found anything very much greater than what was first estimated, and my impression now, is that there was no official report made. I believe that the engineers have stated at various times to the Minister that the quantities were larger than they had expected.

By the Honorable Mr. McLelan:—

Q. Had you reason to suppose that those were approximate to exact quantities when the contracts were let?—I know from the way in which quantities are taken out on first profiles, that such quantities cannot be very correct. It is almost impossible until a line has been cleared of trees, especially in a rough country, to locate it properly, and I understand that those quantities were taken out from a profile which was made of a line simply chopped through the bush. It is only when you get the line cleared, about 100 feet wide that you can clearly see the undulations of the ground. You can then correct the line and change it, and the quantities are thus likely to be very much disturbed.

Q. Then you would not have taken these as exact quantities?—Not sufficiently exact to make a lump contract.

By the Honorable Mr. Macpherson :—

Q. Would you consider them approximate?—I would consider them approximate.

Q. What deviation from the estimate of loose rock—3,000 yards—would you consider approximate?—The estimated value of the whole section should not differ more than from ten to fifteen per cent.

Q. That would be as likely to fall under, as to exceed the estimate, would it not?—It might.

By the Honorable Mr. McLelan :—

Q. What items are most likely to vary in a work of this description?—Items connected with excavation on a side hill might vary very much.

Q. Earth and rock, I suppose?—Yes.

Q. Then, in deciding on tenders it is essential to look at the prices of earth and rock?—It is.

By the Honorable Mr. Macpherson :—

Q. You do not content yourself with looking at the totals?—We are very much guided by the totals, but the prices are analyzed also.

Q. The consistency of the tender is considered?—Yes.

Q. And the consistency of the prices for the various items?—Yes.

By the Honorable Mr. McLelan :—

Q. By the increase of certain items this may not have proved to be as low as some other tenders?—It is possible.

By the Honorable Mr. Penny :—

Q. But do you know whether it was really so?—I have been told it is not. The Chief Engineer could give you a better opinion on that.

The witness was then asked to prepare a statement showing the comparative cost of the work as moneyed out under the different tenders on the original estimate, and under the change in the contract.

T. TRUDEAU.

F. BRAUN, Secretary, Department of Public Works, recalled and further examined as follows:—

By the Honorable Mr. Macpherson :—

Q. Have you any information to give us to-day about the correspondence?—I saw Mr. Smith and enquired of him about that telegram that he stated in his evidence had been sent here asking for Mr. Fleming's recommendation and report, and that I had forwarded him such a document. He said that he had not sent any message to me, nor had he received any report from me. The message had been sent by Mr. Rowan to Mr. Smellie in Mr. Fleming's office. There is no communication of the kind in my Department, and consequently no answer was sent.

F. BRAUN.

COMMITTEE ROOM,
Monday, April 28th, 1879.

Mr. MARCUS SMITH recalled and further examined :—

By the Honorable Mr. Macpherson :—

Q. From the Red River west you have described us the country leading to Pine River Pass; will you please continue that description?—In 1877 I made an exploration from Red River to Lake La Biche, about 750 miles.

Q. How far is that route north of the Saskatchewan?—It varies a good deal. It crosses the Saskatchewan at Fort à la Corne just below where the two branches join. We cross the whole stream with one bridge instead of two. Then we are along on the divide, which is a low divide between the Saskatchewan and the Beaver Valley. The crossing is about 1,200 feet, and there is no other stream or crossing of any importance until we come to Beaver River, which is only about 100 feet wide. I had the crossing of the Arthabasca River measured, which is from 800 to 1,000 feet wide, approximate measurement. Then I ascertained from the Hudson's Bay Officers that the stream, which is the outlet of Lesser Slave Lake, is about 300 feet wide. I had previous information as to the country west of that from Messrs. Hoeetzky and Macoun, who travelled across those hills west of Arthabasca River, and struck the Lesser Slave Lake about the centre, and then down to the Peace River from whence they travelled on the north side of the Peace River to Dunvegan. They give a description of that portion of the country.

By the Honorable Mr. Haythorne:—

Q. Is the bridge on the stream, at Lesser Slave Lake, an important matter?—No; it is a stream of about 300 feet wide, but not a deep valley. We had an exploration made, extending from the west side of the Rocky Mountains across the divide of the continent near the Giscombe Portage, which is really the water-shed of the continent. The streams flow north-east and south-west from there. It is 2,400 feet above sea level. The exploration extended by Fort Macleod through the Pine River Pass, and some forty miles beyond it to Mud River. The particulars of that exploration are given in the Reports of 1878, Appendix G.

Q. From Lac la Biche to the point of the Pine River Pass is how far?—It is reckoned 1,000 miles from Red River to the Pine River Pass. I may state in making that map, we availed ourselves of all the information we could obtain—for instance, Palliser's Report, which is a very excellent one. I also spent several weeks in the vicinity of Lac la Biche, Edmonton and Victoria, and I got all the information I could get. I obtained a very large amount of information from people who had resided there, some of them for twenty-five years, and had travelled through that country. I may mention Bishop Farren, who had a mission there. He not only gave me all the information he could himself, but he sent after hunters and trappers who knew the country to inform me on different points. I also got information from the Hudson's Bay Company's officers at different posts, and our own surveyors spent two years in making surveys. The map is laid down from information thus obtained; but you must understand distinctly it is given as a general map. For instance, I don't say that the whole country shown on the map as deserts is all desert,—there may be some patches of good land in it; nor is the whole country marked as buffalo plains, buffalo plains—there may be some good sections of country through it. These coloured sections merely show the preponderating character of the soil as described in the margin. I could not go into details; and that was the objection Mr. Fleming has to the map, for people who would take contracts based upon the information obtained from it would be disappointed in finding the country marked wheat land, not all wheat land. The report does not always go with the map, and for fear people might be misled by the map without an explanation, I took an extract from the report, and attached it to the margin of the map. From Lac la Biche to Pine River is 350 miles—where we first strike the La Biche River—that is 400 miles from Red River to Pine River Pass. I will read you a description of the country from the report of 1878:—

"A line drawn from Winnipeg to Fort à la Corne, near the confluence of the two branches of the Saskatchewan, would cut off the south-west angle of Lake Manitoba, skirt the north-eastern base of Riding Mountain, cross the north end of Duck Mountain, and pass 15 to 20 miles north of Fort Pelly and across the Basquia Hills. If this line were extended through the Beaver Valley to Lac la Biche, thence by the Lesser Slave Lake, so as to intersect the Peace River near the mouth of Smoky River, it would show the general course of the great fertile belt of agricultural lands in the North-West Territory. It is not to be expected that in a stretch of over 1,000 miles

the soil will be uniformly good. The fertile belt is accordingly very irregular, often intersected by muskegs and lakes, and low ranges of hills on which the soil is of variable quality; there are, however, vast tracts of extraordinary fertility. Both the quality of the soil and the solubrity of the climate improve towards the north-west, whilst investigations have shewn that even beyond Peace River the productive powers of the land are astonishingly great."

By the Honorable Mr. Penny :—

Q. You talk of the fertile belt as being here to the north?—I said to you last year I understood that a number of gentlemen had represented that the fertile belt was along to the south of Lake Manitoba, and along the Riding and Duck Mountains. I am satisfied that the soil from Red River along by the south of Lake Manitoba and up the Little Saskatchewan is good land. But between that and the Touchwood Hills the soil is light, and beyond that the buffalo plains are almost sterile, and destitute of water.

By the Honorable Mr. Macpherson :—

Q. What you have read from the Report is a general description of the country?—Yes; the general formation of the country. At the boundary line the altitude is high. It is not far from the divide between the waters flowing into the Mississippi from the south, and the waters flowing north. The land near the boundary line is very high, as it falls to the north and north-east, the soil has been denuded in the course of centuries of its productive qualities, which have been deposited on the lower levels towards the north. Consequently we find that the soil is light and arid near the boundary line. Then there is a gradation takes place. We have better soil further north, but not generally fit for agriculture. It is a grazing country—what is called the buffalo plains. There are long stretches without water intersected with few valleys, through which flow large streams. As you go still further north the soil improves, and where you see on the map sections marked with green color, it is a fertile but light soil, more suitable for the growth of barley and oats than wheat, although some of it would grow wheat, I dare say. The country shown by the buff color on the map—that is the furthest to the north—is of a much lower altitude, and the soil is generally heavy clay loam more suitable for wheat growing, but it is intersected by hills and muskegs in many places.

By the Honorable Mr. Macpherson :—

Q. Does not the Saskatchewan intercept all those rivers flowing to the south?—From the description of the country it does, and we have all those streams to cross. You will find in the Engineer's Report a description of the character of that line In the Report of 1877, pages 375 to 381, inclusive, you will find a description given of almost every important stream and valley; besides these streams there are what is called "coolies"—wide, deep ravines, some of them over 2,000 feet wide and 100 feet deep; but there is not much water in them, only small streams flowing down the middle. There is a very large amount of bridging on that line. On the Pine River line we cross the Saskatchewan with one bridge below the forks of the river; consequently with one bridge we pass all the water that comes in there from a vast extent of country. The bridge, of course, would be a costly structure, but very little larger than where the same river is crossed on the other line.

Q. Do you mean to say that all the waters flowing in towards the Saskatchewan from the boundary line will be crossed at that point?—The greater portion, and it will all pass under one bridge, instead of the great many bridges on the other line.

Q. Is the new line from Selkirk westward laid down on any map?—I do not know that it is laid down on any Government map, but there are two private companies applying for charters who have it laid down on their maps. It is almost a straight line from Red River, passing south of Lake Manitoba.

Q. Where about will it connect with the located line?—It could be taken as I have shown you on this map. I may mention that in 1877 I made an examination of the country, with a view to seeing whether it is practicable to take a line south of Lake Manitoba. The result of that examination is given in the Report of 1878, pp.

21 to 23 (including the map). The line that is laid down from Selkirk, nearly due west on one, or parallel to one, of the township lines, is the line that the Government has approximately decided to construct. It was proposed by those who suggested that line in 1877, to join the located line at the bend of the Saskatchewan, some five hundred miles west. The country at that part is found to be very rough, and there is a great deal of it poor land. I believe, from previous Reports, that after going to the south end of Lake Manitoba, the line can be deviated to the north-west and strike the located line at Northcote, at the north end of Duck Mountain, in the Swan River Valley. That will, of course, lengthen the line; I do not know how much—a few miles—but it will undoubtedly go through a far better country; and the Government seems to take the same view of the line that I do, that it is essentially a colonization line, and will open up a fertile country for settlement.

By the Honorable Mr. Hope:—

Q. Then you advise the Government to take the line south of Lake Manitoba?—I did not advise them.

By the Honorable Mr. Penny:—

Q. I understood that your Report was unfavorable to that line last year?—At page 23 of my Report you will see that I give it a qualified approval. One reason is, I was confined to a certain point. If I had been asked to examine the country four or five years before—before the line was located to Selkirk—I would not have advised the location from Rat Portage to Selkirk at all; I would have gone further south and crossed Red River nearer Winnipeg. It would not have lengthened the line so much. But you see I was confined to Selkirk as a starting point, as contracts had been given out and a certain amount of work had been done. It certainly would pass through a much better section of country south of Lake Manitoba.

By the Honorable Mr. Macpherson:—

Q. How far south of Selkirk would you have crossed?—I would have selected a place near the rapids about midway between Selkirk and Winnipeg.

By the Honorable Mr. Hope:—

Q. Is not Selkirk a good place for the crossing?—Yes.

Q. Better than further south?—There have been floods further south that have covered the whole site of the City of Winnipeg with a considerable depth of water, and to avoid the possibility of such floods it was thought better to keep further down the river, where that objection did not exist.

By the Honorable Mr. Macpherson:—

Q. Are the banks of the river bolder at the rapids than at Selkirk?—I do not know that they are, I did not examine it specially; that point was fixed, and I did not go and examine the crossing.

Q. Do you know whether the work would have been lighter on the line you speak of from Rat Portage to the rapids, than from Rat Portage to Selkirk?—I think it would, and I can explain my reason for thinking so. Rat Portage is the point where the line from Lake Superior crosses the Winnipeg River just at the outlet of Lake of the Woods. The line that has been adopted goes as direct as the rough nature of the country will admit, to Cross Lake. From Rat Portage to Cross Lake is the section known as section 15; then from Cross Lake to Selkirk the line is continued nearly as direct as possible. That line was put under contract in 1874 or 1875. You will see by the roughly dotted line on the map running in a north-westerly direction, it shows approximately the edge of the Laurentian or rock formation and the prairie country. You will observe that the line to Cross Lake is taken nearly directly west, while the dividing line between the rocky and the prairie country is north-west; consequently it crosses that dividing line at an acute angle. Had the line been taken from Rat Portage towards the south end of Clearwater Bay, which is part of Lake of the Woods, we should have got out of the rocky country some twenty or twenty-four miles sooner than we do on the located line. Then taking the line direct from there to any point on the Red River we like, the country is easy, and it would have saved a great deal of the work that has to be done on section 15.

Q. Would the works have been any heavier for the distance, mile for mile?—It would have been about the same mile for mile, and we would have had a great reduction of rocky country.

By the Honorable Mr. Penny:—

Q. The original line was located by Sandford Fleming, was it not?—Yes.

Q. Was he aware of the conformation of the country you speak of?—A survey had been made by Mr. Carre, resident engineer, on section 15.

By the Honorable Mr. Scott:—

Q. Have you been over this line you speak of?—No; but as I have said there was a survey made of the line I have mentioned by Mr. Carre; but the difficulty was that the contract for section 14, from Cross Lake to Selkirk, had been let, and a considerable portion of it was under construction before this survey was made. I had nothing to do with it myself; but I understood from conversations with Mr. Carre in the office that $350,000 would have been saved by the adoption of that line.

Q. Has he been over both lines?—He made the survey, and I have seen the plans and profiles.

By the Honorable Mr. McLelan:—

Q. He made both of the surveys?—Yes.

By the Honorable Mr. Macpherson:—

Q. So you think if the present location west of Red River had been made earlier it would have affected the location east of the river?—I think so. If they had chosen the line south of Lake Manitoba some years earlier, before section 14 was put under contract, it certainly would have affected the location east of Red River.

By the Honorable Mr. Haythorne:—

Q. Do you consider that the route south of Lake Manitoba would avoid the deep ravines that were considered last Session such great obstacles at the Assiniboine?—The Government have only determined to construct a certain length—some eighty miles.

By the Honorable Mr. Macpherson:—

Q. Is that west of Red River?—Yes; I think the portion along up to the south end of Lake Manitoba is all that they have decided to construct, and it does not extend as far as the Assiniboine. I only speak from what I have seen in the newspapers.

By the Honorable Mr. Penny:—

Q. You agree with the Government that this is to be a colonization road. Is it to be continued across the continent as a colonization road?—In locating the road I have tried to locate the trunk line, so as to embrace as much of the agricultural and mineral lands as possible.

Q. But would you go out of your road in other places to take in such a country, would you deviate twenty or thirty miles at any point to make the road a colonization road?—This is a special case. The intention at first was to adopt the other line.

Q. But if you found other places where by going twenty or thirty miles out of your way to take in a good country, would you deviate the line for that purpose?—If there was a section of country decidedly superior to another I would go out of my way to pass through it, and the line could subsequently be shortened. I have no doubt that both of those lines will be constructed in the future. After the country gets well settled up it will be necessary, probably, to shorten the through route. If the line had been made, as laid down on the map, from Selkirk directly through the Narrows, there would have been other parties applying for charters to build a road south of the Lake.

By the Honorable Mr. Macpherson:—

Q. But had you been called upon to advise as to which route should be selected before any money had been expended west of Rat Portage, would you have advised a line south of Lake Manitoba or not?—I don't know that they had the information we have now. The reason of its being taken south of Lake Manitoba is that it has been ascertained that there is a very much larger quantity of fertile land there.

But if you had been free when surveying from Rat Portage westward, would you have passed south or north of Lake Manitoba?—I don't know; I would have had to examine the country. If it had been decided to run south of Lake Manitoba, I would taken a more direct line. The road was run in the most direct line for Swan River Valley, but now as it is changed to the south of Lake Manitoba, it would have been better to have crossed Red River further south.

By the Honorable Mr. Hope:—

Q. Is there not great difficulty in finding a foundation for a bridge south of Selkirk?—It is not a good river for foundations. It is a very deep soil but there are points, at the rapids for instance. I would expect to find a rock foundation in the river.

Q. Is there not great danger of the ice blocking up the river and drowning out the people by building a bridge south of Selkirk?—There have been ice jams at different periods that have flooded the country I am told, to a depth of several feet on the town side of Winnipeg, and for several miles back.

Q. And the bridge may add to that danger?—It would depend upon where the bridge was located. I do not think it would affect it in that way if it were built at the rapids. I wish the Committee to understand with reference to this question of location, that I do not find any fault with the location through by the Narrows, as it was evidently intended as the most direct through line, and they had a different view in making that location from what the Government has now.

By the Honorable Mr. Penny:—

Q. One is a through line and the other is a roundabout way for the purpose of colonization?—That is about it.

Q. When you visited section 15 in August, 1878, did you find that the character of the work had been changed?—There was not much change then, but they were making the rock embankments for the reception of the earth, in accordance with Mr. Rowan's plan and report that he submitted to Mr. Fleming.

Q. What action did you take then?—I did not meet Mr. Rowan on the works. I went along the works myself and examined them with Mr. Carre; and when I arrived at Winnipeg I met Mr. Rowan, and asked him to explain what he was doing with regard to the works, and what plan he was acting upon. I understood him to reply that he had instructions from Mr. Fleming to act in accordance with the recommendation that Mr. Fleming had made to the Department in a letter which I had not seen. I asked him if he could get that letter. He said he had not a copy of it. I told him then to telegraph to Ottawa for it.

Q. You said in your former evidence that you telegraphed to Mr. Braun. Did you do so?—That is a mistake. I simply said, as far as I recollect, to Mr. Rowan, to telegraph to Ottawa.

Q. You instructed Mr. Rowan to telegraph to Ottawa?—When I said I had telegraphed to Ottawa, I thought Mr. Rowan had done so in my name.

Q. Have you a copy of that telegram with you?—(Telegram produced.)

(Copy.) EXHIBIT H.

Telegram.

WINNIPEG, September 7, 1878.

Send copy Whitehead's letter offering to fill banks with earth, and Fleming's report thereon.

(Signed) J. H. ROWAN.

To W. B. SMELLIE,
Ottawa.

Letter.

OTTAWA, Sept. 10, 1878.

DEAR SIR,—As requested in your telegram of the 7th inst., I herewith enclose copy of the whole correspondence on the subject of permanent embankments on Contract 15, instead of trestle-work, viz.:—

1. Report by Mr. Fleming, dated 22nd May, 1878.
2. " Jas. H. Rowan, dated 22nd May, 1878.
3. Proposal of Jos. Whitehead, dated 6th November, 1877.

Yours truly,
(Signed) W. B. SMELLIE.

P.S.—No. 103 are the documents specified in your telegram.

JAS. H. ROWAN,
Winnipeg.

By the Honorable Mr. Macpherson:—

Q. I think you said in your former evidence that before leaving Ottawa you had not received any intimation of the intended change?—There was no intimation made to me at all; it was never mentioned. I found a letter and report since I gave my former evidence, that would qualify it to a certain extent. Early in the spring, in the month of March last, I think it was, Mr. Rowan was making an estimate relating to the change in the character of the work suggested by Mr. Whitehead. I glanced at his estimate, and from a letter which I found within the last day or two, it appears that he submitted that report to me; but I never examined it officially. I may have glanced at it; but I was very busy with other work at the time, and I took no notice of it. Then Mr. Fleming arrived, and Mr. Rowan made out a fresh report and submitted it to Mr. Fleming. That is the report which Mr. Fleming submits with his letter to the Government; it is dated in May. From the time Mr. Fleming arrived, I had no communication about it, either with the Government or Mr. Fleming, or Mr. Rowan. From the time he arrived he took the thing entirely into his own hands, and I knew nothing at all about what was taking place. I left in July, nearly two months after Mr. Fleming wrote this.

By the Honorable Mr. Cornwall:—

Q. But when he went away all those reports were in the office, and open to your inspection?—Yes; but I had nothing to do with them. He left in May some time, and I left on the 24th July. Mr. Mackenzie sent for me, and we had conversations about things he wished me to investigate; but he never mentioned that at all.

Q. Mr. Fleming's letter-book was open to you all that time?—I did not read Mr. Fleming's letter-book; I may say there was a special reason why I did not examine into Mr. Fleming's papers. All the time he was in Ottawa I had no communication with him at all.

By the Honorable Mr. Penny:—

Q. I believe you were not good friends?—Yes, but I asked the reason for some things, and he said he was told not to communicate with me, and I felt some diffidence in looking into his books, as it did not seem to be desired that I should interfere with anything that they had done. If I had looked into his letter-book I would have seen this letter. I think it was a very important letter, and it appears it has never been answered.

By the Honorable Mr. Hope:—

Q. Then the thing must have fallen to the ground?—I do not know that. The engineers appeared to have been acting on it, and I had no doubt that it had been approved of. If I had had any doubt, I certainly should have written to the Government. No doubt Mr. Fleming expected it to be approved of when he sent that letter to the Minister of Public Works recommending it.

By the Honorable Mr. Penny :—

Q. If I were to send you a note asking if I might draw on you for a hundred pounds, and get no answer, would you expect me to draw on you for that amount?—This is a different matter. The recommendation of engineers are generally adopted unless they are disputed, without any letter at all.

By the Honorable Mr. Macpherson :—

Q. Do you mean that such a report as Mr. Fleming's would not be sent in, unless it was understood by him that the Government would approve of it?—I think it would be understood that it would be approved and had been discussed before hand.

Q. Is that the usual mode?—It is very often done.

By the Honorable Mr. Penny :—

Q. Is it usual to agree to a thing before the recommendation is made?—It is very often discussed verbally before the recommendation is made officially.

By the Honorable Mr. Macpherson :—

Q. Did Mr. Fleming say who told him not to speak to you about it?—Not about that, but about general business. He was asked to make a report on the section of the railway to the Pacific, and Mr. Cambie was asked to make a report, but I never saw either of their reports until they were submitted to the House.

Q. Then you went up there, not knowing that any recommendation was ma that the change should be carried out?—I did not know it.

Q. Then when you went there, you found that the change was being carried out?—Yes; preparing to go on with the solid work. They had no timber for trestle-work on the ground.

Q. And you made no report to the Government?—No.

Q. You allowed it to continue without any authority?—Beyond Mr. Fleming's letter, I had no instructions or no authority from the Government.

By the Honorable Mr. Macpherson :—

Q. Did you report to the Government when you came down—what time did you get back here?—I did not get back until November, and the Government was out then.

By the Honorable Mr. Penny :—

Q. Would you think yourself authorized to make a change of that kind when you were acting Chief Engineer, by a mere letter addressed to Mr. Mackenzie, without having his reply?—On the face of the documents the change involved only $260,000 instead of what it has cost. Instead of that it is going to cost $900,000. I did not make the estimate, and I knew nothing about it.

Q. When you went over the ground did you not perceive that the estimate of $260,000 was was too little?—No; I did not. I asked Mr. Rowan to make an estimate as close as he possibly could, and that estimate I have not received yet.

By the Honorable Mr. Penny.

Q. Supposing on another section where there was trestle-work, it came into your head to fill it up with earth and stone in the way this was done, you would think that merely writing a letter to Dr. Tupper, recommending this change, would be sufficient authority to go on with it, without having any authority from Dr. Tupper?—No, I would not; but knowing that this thing had been discussed between Mr. Fleming and Mr. Mackenzie previously, led me to suppose it had been authorized.

Q. But you did not know what had been decided upon?—I did not.

Q. How do you know that it was discussed?—Mr. Rowan I think stated in the Committee last year that it had been discussed. A general question of trestle-work *versus* embankments was discussed, but there was no proposition made at that time when the Committee was sitting. The proposition to change the works was made after the Committee rose, but I do not know anything of this proposition having been made.

By the Honorable Mr. Cornwall:—

Q. You did not know that Mr. Fleming had any communication with the Minister of Public Works with reference to the change that was proposed by Mr. Rowan?—No, I did not; nothing more than I heard that it was discussed. The contractor was evidently acting upon Mr. Fleming's letter, as he had provided no timber for trestle-work, and I came to the conclusion that if it were not intended that they should go on with it, we would have had instructions not to allow it.

By the Honorable Mr. Macpherson:—

Q. What is the date of Mr. Whitehead's letter?—The letter to Mr. Rowan is dated November 6th, 1877.

Q. Had you any conversation with the Minister before leaving for the West?—When leaving for the West I had a conversation with the Minister, and that subject was never mentioned.

By the Honorable Mr. McLellan:—

Q. The Minister was not likely to mention it, I suppose, because the change had been disallowed?—Then he ought to have told me so before I left.

By the Honorable Mr. Penny:—

Q. Do you think that it was necessary for you to have an affirmative and positive order, and not a negative order, before you went on with a thing of that kind?—I should have had a negative order. I think the Government ought to have answered that letter.

By the Honorable Mr. Haythorne:—

Q. The change had not been seriously contemplated at the time you had this conversation with Mr. Mackenzie?—Yes, the recommendation had been sent in.

Q. But it had not gone further than this letter of Mr. Whitehead's to Mr. Rowan?—Yes, Mr. Whitehead's letter and Mr. Rowan's recommendation were sent in before Mr. Fleming's recommendation was sent into the Department on the 22nd May, 1878. I left Ottawa on the 24th July, nearly two months later.

By the Honorable Mr. Penny:—

Q. At all events, you permitted the work to go on, not knowing whether the Government assented to it or not?—On the strength of the Engineer-in-Chief's letter I did, so far as the placing of the rock which had to be done in any case.

By the Honorable Mr. McLellan:—

Q. Mr. Rowan appeared to be acting on that letter?—The stone embankments were being made for the reception of earth in the way he proposed.

Q. Mr. Rowan had a knowledge of Mr. Fleming's recommendation, and was acting upon it?—It was through Mr. Rowan that I knew the letter was in existence. I did not know that such a letter was in existence until he told me; and when he did tell me, I asked him to telegraph to Ottawa about it.

Q. Then Mr. Rowan appeared to be aware of those letters, reports and recommendations, and to be acting upon them?—Mr. Rowan appeared to be aware of all the recommendation, and was acting upon Mr. Fleming's letter, but there was very little done. They were preparing for the change, and every one seemed to be aware that this change was to be made. There was not a stick of timber on the ground for the trestle-work. The preparation was being made for the earthwork.

By the Honorable Mr. Penny:—

Q. You speak of "all those reports." How many were there?—One report and a letter. Mr. Rowan's report and Mr. Fleming's report, that were sent to the Minister, are the papers I referred to.

By Mr. Macpherson:—

Q. Are the Committee to understand that the change was acted upon before the report was sent in?—When I was Acting Engineer-in-Chief I never undertook to make a great change without consulting the Minister. I do not say that such was the case here.

By the Honorable Mr. Penny :—

Q. Then your engineering opinions were based upon the opinions of the Minister ?—No. There are two opinions—engineering opinions—and the policy of the Government—to be considered and reconciled. If it were simply a question of engineering opinion, that would easily enough be settled.

By the Honorable Mr. McLelan :—

Q. Is it usual to discuss with the Minister proposed engineering changes before putting them in formal shape in writing?—It is sometimes done; and in fact this very subject was a good deal discussed before the Committee—the general principle of it.

Q. Having explained to the Minister a proposed change, and you finding him opposed to it, is it usual to go any further?—I do not go any further. That is the reason why the thing is discussed beforehand to avoid useless correspondence.

Q. Then if he assents to it you put it in formal shape?—That is my impression That is the way it had been done, and that is the way I had done other things myself.

By the Honorable Mr. Penny :—

Q. Then whenever you write a letter for a thing and do not get an answer, you take it for granted it is not to be done?—I take very good care not to write a letter unless I expect to get what I write for.

By the Honorable Mr. Cornwall :—

Q. Would it not have been better to have telegraphed to the Department of Public Works?—I don't know. I merely wanted a letter and telegraphed to Ottawa for it.

Q. Who had the authority to make the change; was it the Engineering Department, or the Department of Public Works?—Any correspondence that is in the Engineering Department, I telegraph to them for it; if it is in the Public Works Department I telegraph to the Secretary for it. I was not telegraphing for any instructions, I was simply telegraphing for a copy of the letter.

Q. If you had telegraphed to the Public Works Department, the whole thing would have been brought to their notice, would it not?—I don't suppose it would.

Q. As it was, it was not brought to their notice?—I do not know. I did not telegraph to them.

Q. Why did you not telegraph for any order made on that report of Mr. Fleming's, when you only got the report of Mr. Fleming?—I have told you the reason. I assumed that it had been approved of. I had no reason to doubt that it had been approved, and I understood Mr. Rowan to say that Mr. Fleming had instructed him to go on and do that work there. I did not want to come into conflict with Mr. Fleming, as it would appear as though I was doubting his policy in doing so; and I can tell you it was a delicate matter on my part to interfere with him at that time. I would not have let the work go on on Mr. Rowan's word, but when he told me the authority I simply telegraphed for the letter.

Q. Is that letter an authority?—It is the authority upon which Mr. Rowan was acting.

By the Honorable Mr. Penny :—

Q. Is it a sufficient authority?—I think I told you had every reason to believe that Mr. Fleming's suggestion was approved by the Minister.

Q. Did you think that expenditure of $260,000 was justifiable on the basis of having "no reason to doubt"?—You may question whether it was. I thought I was right.

By the Honorable Mr. Haythorne :—

Q. Were you still on the ground when the answer to the telegram arrived?—I was in Winnipeg until the letter came.

By the Honorable Mr. McLelan:—

Q. Did I understand you to say that Rowan gave you to understand that he had instructions from Mr. Fleming to proceed with the work?—I understood him so; that is my impression was that the thing had been all settled. I may have misunderstood him, but that was my understanding.

COMMITTEE ROOM,
Thursday, 1st May, 1879.

HENRY CARRE, called and sworn, was examined as follows:

By the Honorable Mr. Macpherson:—

Q. Did you survey the line of the Canadian Pacific Railway from Rat Portage to Red River?—I did.

Q. Did you run a line south of the located line?—I did.

Q. At what point on Red River did you come out?—We struck the same point with both lines. The south line joined into the present line near Broken Head River.

Q. Is that near Selkirk?—It is about 22 miles east of it.

Q. What point on the Red River did you strike?—Below what they call Sugar Point, at the present crossing.

Q. At Selkirk?—I did not locate the line at the present crossing at all. That was located by some one else.

Q. What is the character of the work between Rat Portage and as far west as you went on the southern line?—It was very rocky for the first 25 miles from Rat Portage west, and I considered I was out of trouble then with the heavy rock work. We would strike small knolls of rock now and then.

Q. Was the country more of a prairie country than on the other line?—Yes; we struck the prairie country sooner.

Q. How many miles west of Rat Portage?—It was 42 miles before it became anything like a level flat.

Q. How many miles until you got out of what you considered the rough rock country?—Twenty-five or twenty-six miles.

Q. On the located line how many miles did you run through the rough rock country?—About 37½ miles. It would take in a portion of section 14.

Q. Would the southern line, if extended to Red River, have been an easier line to construct than the located one?—It was my opinion that it would at the time.

Q. Did you make any estimate of the difference in cost of the two?—Yes; a very rough estimate.

Q. What was it?—I am speaking from memory now. I have the figures, but I have not got them here with me, and I would not like to say without them.

Q. Give us the amount approximately?—I think it was $360,000, or something about that.

By the Honorable Mr. Haythorne:—

Q. In favor of the southern line?—Yes.

Q. Is the country equally difficult on both lines?—No.

Q. Which is the more difficult?—The northern line.

By the Honorable Mr. McLelan:—

Q. Is that estimate made on trestle-work in both cases, or solid embankment?—They were both made on the same basis, but with very inadequate data to go upon.

Q. Were they both on trestle-work?—No; solid embankment.

By the Honorable Mr. Macpherson:—

Q. If the line south of Lake Manitoba had been adopted as the continuation of the Canadian Pacific Railway, would the southern line that you surveyed have been a preferable location to the one adopted between Rat Portage and the River?—I should say so.

By the Honorable Mr. Penny:—

Q. The southern line being so much better than the located line, have you any idea why the latter was adopted?—There was a difference in length, I believe, of 3½ miles. It was that much shorter than the other.

Q. Is that the only reason that you know of?—That is the only reason that I am aware of. The maintenance and running of the line in future were against it, as it would cost more to keep it up.

Q. The shortest line would be the most economical in the long run?—Yes; that was the idea.

By the Honorable Mr. Scott:—

Q. Have you any notes that you took at the time?—Yes.

Q. Was your survey of the southern line with a view to location? Was it such a line as would enable you to judge of quantities?—Yes; it was a location line. Both lines were very rough; a good deal of steep rock—side hill sloping more than one to one, and with no cross-sections, it was impossible to make any accurate estimate as to quantities.

Q. Assuming that the main line west of Red River was to go north of Lake Manitoba, in your judgment was it wise to have taken the northern and shorter line?—There was a difference in length of three and a-half miles against the southern line.

COMMITTEE ROOM,

Friday, 2nd May, 1879.

Mr. TRUDEAU was called and again examined:

(A statement was read by him which will appear as addenda No. 1.)

By the Honorable Mr. Penny:—

Q. Mr. Smith, in explaining how it was that he took Mr. Fleming's letter as the authority or *quasi* authority, said that the fact of such a letter having been written to the Minister of Public Works indicated that previous to the letter having been written, the Minister of Public Works and Mr. Fleming had had conversations on the subject, and that Mr. Fleming must have been aware from those conversations that the Minister of Public Works favored the new project. Is that state of things the one that prevails in the Department, or is it the way business is usually done?—Conversations are not taken as authority. We endeavor to do everything in writing. The Minister never gives important orders in conversation.

Q. You would not, therefore, suppose that the fact that Mr. Fleming addressed to the Minister a recommendation, was proof that the Minister had previously approved of the recommendation therein contained?—I would not.

By the Honorable Mr. Macpherson:—

Q. Is it usual for the Chief Engineer to make any important recommendation without previously talking it over with the Minister, and probably with the Deputy Minister also?—It is very much the practice for an engineer to discuss with the Minister and myself, the necessity of making a certain recommendation before doing so.

By the Honorable Mr. Penny:—

Q. Did he discuss this one with you?—Mr. Fleming was just on the eve of leaving for England, and he was in a very great hurry, and he did not discuss this very much with me.

By the Honorable Mr. Macpherson :—

Q. I think it would be very extraordinary if an officer in a department made an important recommendation without discussing the necessity and policy of it with his superiors. Would you not consider it strange if Mr. Fleming made an important recommendation without having first said something about it to the Minister or yourself, or talked it over with you?—This matter was more discussed between Mr. Rowan and myself.

T TRUDEAU.

Mr. JAMES H. ROWAN, called and sworn, was examined as follows :

By the Honorable Mr. Macpherson :—

Q. Are you the Divisional Engineer who has charge, among other works, of Section 15 of the Pacific Railway?—Yes, I am District Engineer, and Section 15 is in my district.

Q. Have you read the evidence given by Mr. Fleming and Mr. Marcus Smith?—No; I have not. I have just arrived in town, and was before the Commons Committee, and have not seen the evidence given before this Committee at all.

[A portion of the evidence given by Mr. Marcus Smith and Mr. Fleming was here read to the witness.]

By the Honorable Mr. Macpherson :—

Q. Under whose instructions did you act?—If I give it to you in narrative form, I think I can put it in a more intelligible shape by starting from the commencement. I may state that having got pretty full knowledge of the work after the cross sections and everything was completed, on consultation with the Engineer-in-Chief, I found not only from the representations of the Division Engineer, but also of the contractor, that it was going to take a very great length of time to complete the work, if we had to carry out the instructions I had received with reference to the method of constructing the railway over the water stretches in the lakes on the section. I went into the question with the Division Engineer in a pretty full manner, and the result was that I made a recommendation to Mr. Marcus Smith on the subject when he came to Manitoba in the fall of 1877. I pointed out to him the difficulties which had occurred to my mind, and which also the contractor had suggested if he was compelled to carry out the work in that way. Mr. Smith started with me from Winnipeg to the North-West Angle of the Lake of the Woods to go over the work with a view of satisfying himself as to those points to which I had called his attention, and others. We went to the North-West Angle some time late in October, and, by some unfortunate accident, the steamer was not there to meet us, as I had arranged that it should be; and Mr. Smith turned back without going over the work. We then went over Contract 14, or a portion of it, and he expressed himself very much pleased with the manner in which the work had been carried on. We then came back to Winnipeg, and I submitted to him some of these facts with reference to Contract 15, especially with reference to carrying the trestle-work and banks across the water stretches on the section. I showed him in an approximate way the difficulties that were to be contended with, and I proposed certain changes which would obviate those difficulties, illustrating them with a sketch. He was pleased to see the force of the arguments I addressed, and approved of the change. The change was this: That, whereas I was instructed by the Engineer-in-Chief to have the rock brought from the various cuttings put into the embankments, so as to make them up to three feet above high-water level, and broad enough to carry an earth embankment, I suggested that to economise material and reduce the cost of the work, which I was able to show by figures it would do, that instead of making a full rock basement in the water, it would be better to make rock sides to carry trestle-work, leaving the centre to be filled in subsequently with earth. I had calcu-

lations to show him that if we followed this course, the embankments filled up with earth between the rock walls would be cheaper than embankments with a full rock base and earth on top, or a rock base with trestle-work on top, to be subsequently filled in with earth when the trestle-work decayed. Mr. Smith entirely approved of the suggestion, and gave me permission to make this change. The next day, or a day or two afterwards, as well as I can remember, he started for the east to go home; but before doing so Mr. Whitehead had an interview with him and with myself, in which he supplemented my proposition in reference to making the banks in this manner across the water stretches, by saying it was a great pity that the whole contract would not be made solid, instead of using trestle-work, as it would be a permanent work instead of being temporary and perishable.

By the Honorable Mr. Penny:—

Q. Who said that?—Mr. Whitehead, the contractor. That was, in fact, a further proposition, not only should the trestle-work be done away with over the water stretches, and solid banks be made through, as I had suggested, but that the whole thing should be made solid, and the trestle-work entirely done away with; and if that was done he would find the material, no matter how far it had to be hauled, and put it in without charging for any extra haul on such material.

By the Honorable Mr. Macpherson:—

Q. What was the extent of your partial proposition, as compared with that of Mr. Whitehead?—My partial proposition was, wherever there was a water stretch on the section, instead of putting in full rock banks as a base for the earth work, that we should put in sides of rock, and make up the full bank of earth and sand. The original plan was that every void in the banks, from one end of the contract to the other, which we had not material enough on the line to make up, was to be supplied with trestle-work. My proposition eliminated from it that portion which was to go across water stretches.

By the Honorable Mr. McLelan:—

Q. The original plan was to make a rock base and set the trestle-work on it?—Yes, the original plan I was instructed to follow was, in the case of water stretches, to build a rock base to three feet above the high-water level sufficiently wide to carry a subsequent earth embankment, upon which, for a time, only the earth was put in; trestle-work could be placed. The object in view was to keep the timber of the trestle-work out of the water, so that it would not be exposed occasionally to air and occasionally to water, and thereby be rotted.

By the Honorable Mr. Scott:—

Q. What particular period was this?—In the latter end of November, 1877. Mr. Whitehead's proposition was in addition to mine—that the whole trestle-work on the contract should be abandoned and everything should be made solid embankment. Mr. Smith then left, and, having heard these propositions, stated that he would submit the whole matter to the Government when he returned to Ottawa. That was about the beginning of November, 1877. Upon his departure, I wrote to the engineer in charge of that section under me, informing him that Mr. Smith had left; that we had had a discussion in reference to the subject on which he and I had previously been speaking, about these water stretches, and upon the further subject of doing away with trestle-work altogether; and the whole question would be brought before the acting engineer-in-chief on his return to Ottawa. In the meantime he had authorized me to carry out the proposition with reference to embankments across water stretches.

Q. Mr. Smith had instructed you?—Yes, and I instructed the Division Engineer to that effect. Subsequent to that, I think it was the 7th of November, Mr. Whitehead wrote me a letter, embodying in form, at my request, the conversation we had with Mr. Smith. I said, "if you put it in writing what you propose, I will submit it to the Government, with a report on the subject—not to the Government but to my chief." He did so, but before doing so, as I knew that he was about to do it, I wrote

to the Division Engineer, requesting him to communicate to me estimates in various forms which I detailed in my letter to him, asking him what it would cost to do the work with trestle-work, in the way proposed and in various forms; and, if it is desired, I can produce copies of those letters.

By the Honorable Mr. Macpherson :—

Q. Upon these you founded your report?—Yes; having written this to the Division Engineer, the matter remained in abeyance until I came down to Ottawa, about the beginning of January, 1878. I did not, up to that time, receive the information I had asked for from the Division Engineer, for the reason that the contractor had such a large force of men on the works, and was pushing the work so rapidly that the staff was kept as busy as they possibly could be, and he had not the time to furnish me with the details, or to do the work that I desired in this respect. But before leaving I wrote to him urging the necessity of it, and as I was going to Ottawa to forward that information as soon as possible. In March, feeling that the time was passing away, and that nothing was decided on the matter, and that Mr. Whitehead was pressing to know what was to be done in reference to his letter, I submitted a report to Mr. Smith on the subject, a very long report, giving detailed figures and facts in reference to the matter, showing the comparative cost of doing it one way, and of doing it in another, upon such data as I had in my possession.

By the Honorable Mr. Penny :—

Q. Is the report you speak of now the one we have before us?—No; it is not.

By the Honorable Mr. Cornwall :—

Q. Mr. Fleming was not here in March?—No.

Q. That is why you reported to Mr. Smith?—Yes; Mr. Smith was the acting Engineer-in-Chief at the time.

Q. And you sent the report to Mr. Smith?—Yes; I sent a report giving details which will be seen when the report is brought down.

By the Honorable Mr. Scott :—

Q. Was there any memorandum made By Mr. Smith on that report?—I could not say. Having seen that in, I was engaged in other matters, details and works here for some time, and with illness in my family, and no action was taken on this report. Mr. Whitehead applied to me to know what was to be done. It was very desirable to know what course was to be followed with reference to the work, and I asked permission to see the Minister, and he was kind enough to grant me an interview. I asked the Secretary,—Mr. Fleming's secretary,—to get me the report, and I took it into the Minister of Public Works, and read it to him, at least portions of it bearing on the subject, and discussed the matter with him. He seemed very favorably impressed with my report and statement, and he said to me "Mr. Rowan I hope if I remember rightly what he did say) you are quite sure that your calculations are correct; that there is no mistake about them, and that the result will be as you state?" I replied that I was satisfied my calculations were quite correct, and the Minister said so far as the work was concerned, that he was satisfied himself, if my representations were correct, that it would be a very advantageous change to make. Subsequent to that, Mr. Fleming came out to this country, and after he had been here for some time, I asked to have an interview with him. I said I was very desirous to speak with him about work on my division that were in abeyance, and on which I was very anxious to have some definite instructions. I told him what had occurred (about as I am telling it to the Committee now), and I submitted to him the same statements. He was very much pressed for time, and anxious to return to England, and said he had not time to go into details, but he said: "Mr. Rowan are you satisfied that what you represent is correct, and that there will be this economy in doing the works." I said, "I will put it in writing, and submit it to you, and I am prepared to stand or fall by what I represent." I did so, and he told me that he had seen the Minister, and that he had written a report upon it, and he gathered from what the Minister had said, that he was very favorably disposed

towards the change. I left for Manitoba, and we kept going on with the work according to the contract, subject to the change only, that Mr. Marcus Smith had authorized, which was the putting of rock sides across the water stretches instead of solid rock bank, which was to be subsequently filled in with earth. I went back in the beginning of July. By the time I got back to Manitoba, or some time afterwards —I could not give the exact date—but I think it was the latter end of July or the beginning of August, I received a letter from Mr. Marcus Smith informing me that he was on his way up over the line, and would go over Contract 15, examine into everything on it, and see the state of the work. He requested me to meet him at Rat Portage, which was the eastern end of the section. I went down to Rat Portage to meet Mr. Smith, and stopped there a little while, but as he did not come along, and as business of a very pressing character was waiting me in Winnipeg, I returned there and left a letter for Mr. Smith expressing my regret that I was unable to meet him to go over the work with him, but that Mr. Carre was there, and would go over it with him. If I remember right, I think I requested him to express no opinion or views about anything that was done or about to be done on the work, until he had seen and carefully considered the whole work. I came into Winnipeg and attended to the business that was to be looked after there in connection with the Pembina Branch, the work on which had been resumed. Some days afterwards, Mr. Smith arrived at Winnipeg. I met him and said: "I am very glad to see you are come, Mr. Smith, as now we will be able to settle those long-pending questions about Mr. Whitehead's proposition with reference to the substitution of earth-work for trestle-work."

By the Honorable Mr. Scott:—

Q. Do you remember the date of this?—It would be about September last. I said to him I had been anxiously waiting for him to see what would be settled with reference to Section 15. I was under the impression that was the one thing that had brought him over the work—the most important thing, as I supposed. I was rather surprised when he told me that he had not come to settle it at all, that he did not know anything about it. I said, "Mr. Smith, it is very strange. There are reports in the Department about it. Mr. Fleming made a report to the Minister about it; are you not aware of that?" He said that he had not seen it, and did not know anything at all about it. I said, "You have my report that I made to yourself about it?" He said, "I have never seen your report." I said, "You must have forgotten it, because I gave it to you in March last, before Mr. Fleming arrived." He did not seem to remember. He must have forgotten that he had seen it. I said, "The best thing that I can do is to telegraph to Ottawa for copies of Mr. Fleming's letter to the Department, and the one I wrote to him on which his was based." I said I had a copy in the letter-book; but it would be better to send for the original. I showed him the copy I had in the letter-book, and I think I got from Ottawa a copy of the original which was there. I laid the whole matter before him then, and he said he did not feel warranted in expressing any opinion on the matter. He said he could not authorize such a change without the approval of the Government, and that he would submit the matter when he went down to Ottawa.

By the Honorable Mr. Penny:—

Q. Was this after he had seen Mr. Fleming's letter?—Certainly; I had got them all from Ottawa for him.

By the Honorable Mr. Carvell:—

Q. And he said he would see to it when he got down to Ottawa, and I said "it was a great pity that this thing should be left in this shape, as I thought when you went down to Ottawa a year ago, the matter would have been decided, and some action taken, but it has been hanging over since, and is very awkward indeed; where a saving will be effected to the country by doing away with the trestle-work, that it should not be done." I feel very strongly on the subject, because I have no doubt that a great saving can be effected by doing away with the trestle-work, besides the advantage in an engineering point of view which I had submitted in my report both

to him and Mr. Fleming. He said he could do nothing until he had submitted the matter to the Government, which he would do immediately on his going to Ottawa, and have it settled one way or the other; that in the meantime we were to go on as we had been going on, doing works that were common to either, whether it was completed with trestle-work or completed with full embankments.

By the Honorable Mr. Scott :—

Q. The work that he had himself originally authorized ?—Yes; and other things, of which he gave me a memorandum, that it would be applicable to whichever way it was done; and so we have been going on ever since to this day.

By the Honorable Mr. Penny :—

Q. Do you mean you have not made those changes ?—Only the changes he has authorized me to make.

By the Honorable Mr. Scott :—

Q. No changes except what Mr. Marcus Smith has authorized ?—No.

By the Honorable Mr. Macpherson :—

Q. What do they comprise ?—They comprise the doing away with full rock banks across the water-stretches, and the making up of these banks as I have described.

Q. Have those changes had the effect of increasing the expenditure on the contract very largely? The whole quantity of solid rock in the original estimate was 300,000 yards, but according to the return of 28th February last, 342,376 yards had been removed ?—Yes.

Q. Of loose-rock, the original estimate was 30,000 yards, and the quantity executed was 46,711; of earth the original estimate was 80,000 yards, and the quantity executed was 224,306 yards ?—With reference to the increase of quantities, as shown by the figures here compared with the original estimates, I have to say that this increase has nothing whatever to do with the question of solid banks *vs.* trestle-work, or trestle-work *vs.* solid banks. The quantities in the first column of the schedule are, I presume, taken from the contract schedule, and are the approximate quantities that were published at the time the work was tendered for. At that time the location of the line had not been completed, and no cross-sections whatever had been made. The quantity that is given in this column is the quantity that has been executed up to the date of that estimate. The total quantity of solid rock, loose rock, and earth excavation that will have been done on the section, whether trestle-work is put in or whether it is left out, will be considerably in excess of these quantities in the original estimate.

By the Honorable Mr. Scott :—

Q. Your levels and cross-sections are sufficiently advanced to enable you to form some opinion as to what the gross quantity will be ?—I think we can now give a very close approximation indeed, as to what the total amount of the work which the contract will come to, whatever way the work is to be done, whether it is to be trestle-work or full banks. I think we have now all the data necessary to give a very close estimate indeed of what the ultimate cost will be.

Q. Can you state what it is ?—I have not the figures with me, but I can submit a statement if necessary.

Q. Have you the estimate for doing the work both ways ?—Yes; I submitted an approximate estimate of it last year when I submitted this proposition which you have now in your possession. I can submit the estimate for both systems if you desire it.

Q. Was that estimate made by you ?—No, I did not do it personally, but I presume it was made from my figures—that is, the result is arrived at from figures I furnished to the Department.

By the Honorable Mr. Macpherson :—

Q. What we want from you now is a statement of the cost by each mode of construction ?—What I submitted last is an approximate estimate. With the fuller

information we now have, I can estimate what it will cost to do it on the same basis, and show you that our views have been changed by further information.

Q. Did you press Mr. Smith for an answer last winter when you made your report to him?—I cannot say I pressed him.

Q. But you repeatedly asked him?—I cannot say that I even repeatedly asked him. I knew he was very much pressed with work, and I did not feel it was my duty to press him. I had spoken so frequently on the matter before, I did not feel that I was warranted in pressing it.

Q. The estimate which you made in your letter of 22nd May last, was simply for building these rock walls across the water stretches. That was not intended to cover the cost of solid embankments, except over the water stretches?—Yes, it covers everything. It is full banks everywhere instead of trestle-work.

Q. That change proposed by Mr. Smith for the foundation of the trestle-work in the water stretches would lessen the cost?—Yes, very materially. When the report is brought down, you will see in the report I made to Mr. Smith the cost per lineal foot of each kind of bank—done in this way, or done with rock bases or by earth.

By the Honorable Mr. Penny:—

Q. But taking the change throughout, you say it will be cheaper than the trestle-work would be?—It will be presently more expensive, but at the end of six or ten years it will be a decided saving to the country. The present cost will be increased by some $250,000.

By the Honorable Mr Haythorne:—

Q. How about the time.—Will it take longer to construct it in this solid way?—The contractor, as I understood, was prepared to do it almost as quickly as the other way. I know, of course, it would take some little more time to do it this way than with trestle-work, but he was prepared—and did, in fact, verbally state—that there should be very little delay in consequence of the change.

By the Honorable Mr. Macpherson:—

Q. If the trestle-work were made so as to allow trains to run over it, could not the fills have been made more cheaply?—I presume they could. That is my view of the case. In making the calculations which will be submitted to you, I assume, in order to compare the respective cost of the two schemes, to take in a base of bank across the water-stretches. If it were made up with a full rock base and trestle-work put on the top of it to carry out the contract, and fill it up subsequently with earth at 28 cents a yard, instead of at the present contract rates at 37 cents; it would be cheaper to do it in the future at 28 cents.

Q. Then is it still possible to complete the work, so far as the earth voids are concerned, with trestle work?—Yes.

Q. The only change made is in crossing the water-stretches?—We have discovered earth on the works where we never thought there was earth at all, and we have, of course, turned that into the banks, because my instructions were to do that where I could get earth conveniently; but that is only to a small extent. When the work was commenced we anticipated getting hardly any earth on that section. All our explorations were done in the winter season, and we had not the means of boring and testing, and we were not aware that we could get any large quantity of other material than solid or loose rock; but since the contract is opened up, and the men have been at work with tools, we have been enabled to get borrow pits, and we have put earth into the banks.

Q. That was part of the original plan?—Yes; I once reported to Mr. Fleming in reference to the trestle-work as to the grave doubts of the possibility of getting enough timber to make the trestle-work and asked that the grades might be lowered so as to equalize the material. His reply was always "it must be a dreadful country if you cannot get a little earth here and a little earth there, and we will keep the grades as they are. I have lowered them as much as it is prudent to do."

By the Honorable Mr. Christie :—

Q. What kind of timber is obtainable there?—A limited quantity of tamarac and white spruce.

By the Honorable Mr. Scott :—

Q. And poplar?—There is very little poplar on Section 15, but there is what is called "jack pine," and some red pine—very knotty timber. The great trouble with the timber there is its size; it is very difficult to get timber that will square 12 x 12 inches more that 25 feet in length.

Q. Is it very hard timber there?—No, not particularly; that very fact necessitated the designing of special trestle-work for this contract, because we could not get any long timber, and where we had to cross ravines 50 to 70 feet in depth I had to exercise my ingenuity to devise trestle-work to suit, with such short timber. Sometimes the trestle-work ranges from 40 to 50 feet, and in some 75 feet—75 feet is the highest.

By the Honorable Mr. Christie :—

Q. In many instances I fancy you would have to bring the timber a considerable distance?—It would have to be.

Q. How far, on the average?—I think they have had to go twelve or fifteen miles, and I do not know but twenty miles, from the line. We have used a good deal of timber already on the work. The culverts that we have had to put in have used up a considerable amount of timber, and there is a good deal of timber work done on the contract already for bridges designed by the Department.

By the Honorable Mr. Macpherson :—

Q. Of course you ascertained during the survey what timber there was?—To a limited extent we did.

Q. In specifying the quantity of timber to be used in the work, would you do so without knowing where the timber is to be had?—The timber is to be had by going a distance for it. There was nothing said by the Department about it. Indirectly, the contractors were warned that the timber would be pretty hard to get, as in one part of the specification it was stated that that class of work might be done with suitable timber to be found in the country.

Q. The only reason that you have given for the increased cost was the incompleteness of the surveys at the time the contracts were let?—A part of it is due to that fact, of course, and a portion is due to the readjustment of the grades. As I mentioned a few minutes ago, I had requested Mr. Fleming to modify the grades, as I was afraid that we could not get the timber to make the trestle-work. A modification was made, and a portion of the increased cost is due to that; and another is due to the fact that we had only the centre sections and no cross-sections taken. You are are aware that there are places on our line that show bank, but where there are actually cuttings.

By the Honorable Mr. Penny :—

Q. I understood Mr. Smith to say that the grades were lowered on account of this complete change in the character of the work throughout; is that so?—I do not know what Mr. Smith said.

Q. What was the object of lowering the grade?—The object in lowering the grade was to improve the grades for traffic, and to benefit the work by getting rid of some of the heavy embankment. The country is all sidling. We are off one side hill and on to another, and from one lake valley into another. The centre of the road being moved three feet from where it is at present would make from fifteen to twenty thousand yards more embankment, because it takes us off the solid bank, and runs us into water. By taking off earth and putting in a little more rock work it will take off thousands of yards.

Q. It had no reference to this change?—No; it was done before any change was spoken of.

Q. I find this in Mr. Smith's evidence: he was asked "Should there not have been platforms or corduroy put in on those soft places?" His reply was: "In discussing that question with Mr. Rowan, I said 'When you saw that these embankments were swallowing up much more earth than was originally estimated, why did you not think of suggesting some means by which the subsidence could be arrested?' He said he was carrying out the original plan, and that the deepening of the off-take ditches would be sufficient under the circumstances. I replied that I would have corduroyed it with timber."—

Do you think you should have corduroyed it with timber?—No; I do not. It might have been done that way had we known at the time it was going to save such a serious work in some places as it did.

Q. You think it would have been better corduroyed with timber?—No; it will make a better job this way.

By the Honorable Mr. Cornwall:—

Q. Mr. Smith was asked what was the object of lowering the grades, and his answer was "It was to reduce the cost of crossing the ravines and deep depressions as much as possible, and to get material, and more nearly balance the quantities of excavation and embankment."—Mr. Smith's statement is not inaccurate because it does not tally with mine, for there are points in the work in which that effect is produced by the lowering of the grades; but as I understand the question as put to me by the Honorable gentleman here it was done with that object, but it was not done with reference to the substitution of full banks for trestle-work. There were some places where the bank was put into the lake, and trestle-work would have taken nearly the same quantity of rock as it would for a narrow high rock bank nearly all the way across, sufficient to carry the trains. By lowering the grade at that point we got the quantity of rock just sufficient to give the amount required to effect that purpose.

Q. It is in consequence of the lowering of the grade that the total cost has been increased so much?—That is one of the reasons that has increased the quantity of rock work to be done; but it has largely decreased an entirely disproportionate amount of work that will have to be done before the road is completed with solid banks; that is to say, we have added on a yard of rock, and have taken off ten, fifteen, or twenty yards of bank that would at some other time have to be made up.

By the Honorable Mr. Macpherson:—

Q. On whose authority were those changes of grade made?—They were furnished to me from the head office.

Q. Was the head office then under the charge of Mr. Fleming or Mr. Smith?—Under the charge of Mr. Fleming. The contract and specification, I think, state that the right of making a change in the grades at any time during the progress of the work is in the hands of the Engineer-in-Chief, and he may order it to be done without any extra claim on the part of the contractor. It is a schedule contract, and he has got to be paid for whatever he does.

Q. Mr. Smith says there was a total change in the character of the work?—I have not read his evidence.

By the Honorable Mr. Haythorne:—

Q. Were the quantities in the schedule consistent, or could the contractor gain by the change?—I think it is probable that he could. I called attention in the report to the fact that while the country was going to be saved money if the change I suggested were made, there was no doubt in the world it would be a benefit to the contractor, because it was continuing work that he was getting a high price for, and doing away with work that he was getting a low price for; therefore, if it advantaged the country it also advantaged the contractor. That was a matter I had nothing to do with; but I called attention to the fact, and I expressed it as my opinion, that the contractor should be called upon—if the Government approved of the suggestion of mine, by which certain works in connection with the contract would have to be done—to do those works at prices proportionate to the rates he had for the same class

of work, and which are low prices. For instance, he had a low price for first-class masonry. If we put in masonry at other points in consequence of making permanent banks, my suggestion was that he should be required to put in second-class masonry at a proportionate rate for what he was doing first-class masonry.

By the Honorable Mr. Macpherson:—

Q. How was his price for timber?—His prices for timber were, taken on the whole, low; for rock excavation, high; for earth, high; and for loose rock, high.

Q. The effect of the change has been, or would have been, to diminish very much the quantity of timber required, and to increase the rock and earth-work?—If the change is carried out, the quantity of timber will be very considerably reduced; the quantity of rock will not be affected at all, but of course the quantity of earth-work will, because you have got to make up the banks in place of the trestle-work. The quantity of rock will not be affected by the change one way or the other.

By the Honorable Mr. Scott:—

Q. But the changes authorized by Mr. Smith, how do they affect the contract?—They do not affect it.

Q. Masonry does, because you have to build foundations for your trestle work?—No; we put in timber bridges at these points for the present, according to contract.

Q. You have not built up the masonry?—No; we have adhered to the contract because I had no instructions otherwise; but it is my opinion it would have been much better to have put in permanent structures. I have adhered to the contract and put in timber bridges at these points.

By the Honorable Mr. Cornwall:—

Q. You have adhered to the contract, except at certain points at which Mr. Smith authorized you to make changes?—We have done no masonry, but have adhered to the timber structures where culverts should have been put in, and will ultimately have to be put in.

By the Honorable Mr. McLelan:—

Q. Is the contractor at work now on the section?—Yes.

Q. In what condition is the progress?—We are about as near as possible arriving at that position that we must go on either with the trestle-work or the banks. If I am not instructed to put in the banks the trestle-work must go in.

By the Honorable Mr. Christie:—

Q. Has the timber for the trestles been got out, or any portion of it?—There is little or no timber out for the trestle-work as yet.

By the Honorable Mr. Macpherson:—

Q. How long would it take to complete the section by the other plan?—I could not answer that question right off.

Q. Can you approximately?—The contractor takes a very sanguine view of it, and he thinks he can do it very rapidly; but I am not quite so sanguine.

Q. If the banks were made solid, when do you think the section would be ready for business?—I think it would be quite possible to run trains over the road by the setting in of next winter.

Q. Do you mean next autumn, or a year from that time?—Next autumn it would be possible to run trains over the road, but the work would not be finished. To make up those banks the contractor will be obliged to put in temporary trestle-work to haul the earth from a long distance for the banks. When these are partially filled up the trains could go over that trestle-work temporarily.

Q. To complete it without incurring any extraordinary expense to accomplish it, when would it be finished?—We could not do the earth filling in the winter, and it renders it more difficult to say, because it would depend greatly on the state at which the work had arrived in the fall. If it had not advanced sufficiently further, it could not be finished before next spring. If the trestle-work is adopted, I think it is doubtful if it can be finished before next spring.

Q. When do you think it would be so finished as to warrant your accepting the work from the contractor under both plans?—Some time next year, I fancy.

By the Honorable Mr. Scott:

Q. Can you give us any idea of the time that was spent in explorations and surveys before the contract was given out on this particular contract?—I can give you some little idea. In the fall of 1871, we ran one trial line through there. We started from here in July, with all the parties, but I think it was September before we got to the eastern end of the contract to commence the survey. The line was run through there in the winter and spring of 1872; and some time in 1872 I forwarded to the head office the rough preliminary survey that had been made. That was destroyed by the fire when the offices were burned here, and we had to do the work all over again. That was one of the portions we had nothing to show for at all after the fire, and a portion at Pic River.

Q. As you went through you left some marks, did you not?—Yes; of course we had our bench marks, but the levels had to be taken over again.

Q. That was in 1874?—Yes.

By the Honorable Mr. Penny:—

Q. That fire, I suppose, was partly the cause of the survey being so large?—Yes.

By the Honorable Mr. Macpherson:—

Q. How much did it increase it?—I could not answer that. There was a portion from Eagle River to Rat Portage, and from Pic River to a few miles east of Michipocortin, of which the notes were lost. I think it was in 1874 a party was sent up there to locate the line, and a trial survey was run through again. We had some rough notes on a plan or tracing or something, of where the line had been run by the previous engineer, Mr. Jarvis, and there were some difficulties that I remembered were found on that line, so I tried further south for another line and got a better one with the grades I was instructed to get. I think that was in 1874.

Q. What next was done?—After that I think we ran another line further south, as it was suggested we could get a better line by following the shores of Lake of the Woods, and approaching more closely to the North-West Angle, and then turned back again to the eastward of this rough country. Another survey was then made, and a re-location of the work as it is now being done. Modified locations and improvements have been made up to the present time. We have made some changes in the location of the line that have been a decided improvement, on some suggestions made by Mr. Smith himself.

Q. Who made the location surveys?—Mr. Carre, the gentleman now in charge of the division. I have no doubt he can give you some information with regard to the time occupied in the surveys. It is a pretty hard country to locate a line of railway through.

By the Honorable Mr. Penny:—

Q. Have you got the instructions by which Mr. Smith authorized you to make certain changes with regard to the water stretches?—They were verbal instructions in the office. I will hand you a copy of the letter which I wrote to Mr. Carre acting on those instructions. I wrote it immediately after.

Mr. James Baines, Accountant, Department of Public Works, was re-called and examined as follows:—

By the Honorable Mr. Macpherson:—

Q. Have you brought a statement of the cost of the survey between Lake Superior and Rat Portage, and from Rat Portage to the Red River?—No I have not. I thought I could have obtained an approximate estimate from finding out the different engineers in charge of the work, and the cost for each party; but I could not

even get that. The books were not kept to show the expenditures of each party for the last eight years, and I have no control over them. There is a person specially appointed who attends to that class of accounts.

Q. Who is he? Can he furnish the information we require?—I don't know. There are two classes—from 1871 to 1874 were made up by Mr. Taylor, and from 1874 to 1877 were made up by Mr. Radford, of Montreal.

Q. You cannot separate the cost of the surveying of the different sections?—No. They were not separated the last few years, because there were surveys going on both east and west. In fact I am entirely ignorant of the matter.

Q. You are the accountant of the Department?—Yes.

Mr. MARCUS SMITH re-called:—

By the Honorable Mr. Macpherson:—

Q. Have you the report Mr. Rowan said he made to you in March, 1877?—No. I have not the report. In fact it had almost escaped my memory that there had been such a report at all. I see it is mentioned in Mr. Rowan's letter at Winnipeg, but I have not got it. I remember something of the report now. It was in March, and I was very busy at the time; I was very busy and I simply glanced at it, but did not consider it at all.

SENATE COMMITTEE ROOM,
Monday, May 5th, 1879.

MR. MARCUS SMITH was re-called, and presented a written reply to the letter of Mr. Fleming which appears in the Appendix, and his examination was continued as follows:—

The schedule "C" that has been sent in will show that before I went out to the works that the change had been contemplated, as these schedules were made from estimates of Mr. Rowan before Mr. Fleming's report was sent in. If you compare the schedule with the original quantities, you will find it had been intended to fill the embankments up with earth before I went out there at all.

By the Honorable Mr. Haythorne:—

Q. I was led to suppose by your evidence some days ago that the change from trestle-work to stone and earth embankments was already in progress; but, on hearing Mr. Rowan's evidence, it would seem that there was no change actually in progress, except a change in crossing some small lakes which would have the effect of economizing expenditure. Now, if I understand your former evidence, it was to the effect that the change was in progress throughout the section?—I have stated in my evidence that there was not much done, but what was done was increased with the proposed change. The rock embankments was the first thing that had to be done, and many months must have elapsed before the earth could be put in; but they certainly contemplated putting earth on because the contractor had asked for bills of timber for his trestle-work, and those bills were very meagre, simply for a few bridges for crossing streams.

Q. Your evidence left the impression on my mind, and I think on the minds of other members of this Committee, that some considerable expense had already been incurred in making this change. Mr. Rowan's evidence led us to suppose that the works had now arrived at the point when a determination must be come to one way or the other?—There might have been the impression that there was much done. I think in my evidence I corrected the impression, and said that the distribution of the rock would do either way, and that it is the most economical distribution of the earth.

By the Honorable Mr. Cornwall:—

Q. How is it that you should have suppressed all mention of this visit to the works in 1877?—I do not remember that I was asked if I was there in 1877?

Q. I asked why suppress all mention of it?—I was not asked the question.

Q. How is it you suppressed all mention of Mr. Rowan's letter to you in March, 1878? Do you deny the receipt of the letter from Rowan in March, 1878, having reference to these changes?—I think I have given evidence already that I received a letter from Mr. Rowan which I did not consider at all; a letter with some estimates.

Q. Then what do you mean by saying you knew nothing of these proposed changes until you went on the works in 1878?—I said I knew nothing of their having being brought before the Department. I knew that Mr. Rowan sent in an estimate to me, which I merely glanced at, as I was very busy at the time I received it. It seemed to me to be a sort of estimate on some changes that would affect the cost of the work, but I never had time to go into it, and I never submitted it to the Department at all. Before I had time to look into it, Mr. Fleming arrived, and Mr. Rowan made a fresh proposition to him, so that I never went into it at all.

By the Honorable Mr. Haythorne:—

Q. I think that the first intimation that the Committee had that the change had been resolved on for the crossing of those lakes, from trestle-work to stone and earth, was the verbal communication which you made to him yourself, at Winnipeg, in the autumn of 1877, which he communicated to the division engineer, which has verified the fact and given it date?—There was a special case that came before me, a small length of two lakes about a mile, and the distribution of the rock that way was better, in my opinion, and more economical than according to the instructions of Mr. Fleming. I approved of that change for that portion of the work. I mentioned it to Mr. Mackenzie when I came home, and he approved of it also, but I gave no general approval of the system. I gave special instructions that anything they had to propose to submit it to me, and that they were not to take this as an approval of the general change.

By the Honorable Mr. McLellan:—

Q. You submitted the proposition of Mr. Whitehead, and the report of the engineers, but I asked you is the report Mr. Rowan sent to you the only report in the Department recommending the change, and you replied "that is all I know of in the office"?—I have never seen that report since.

By the Honorable Mr. Cornwall:—

Q. What became of the report?—I do not know what became of it.

Mr. JAMES H. ROWAN was re-called, and examined as follows:—

By the Honorable Mr. Macpherson:—

Q. You promised us schedules of the estimated cost of completing the work under both systems. Have you got them?—I did promise it, but I have only been able to get one copy completed as yet, I had so many papers to copy for another committee. The schedule I now produce as Exhibit "I," is an approximate estimate.

CANADIAN PACIFIC

MANITOBA DISTRICT.—

APPROXIMATE ESTIMATE of Cost to complete, at Contract rates and Schedule latter being revised;—Also, approximate cost to complete, at contract rates, the District Engineer, dated the Fifth of March, 1878, and Twenty-Second of

Description of Work.		Contract Rates.	*Schedule Quantities.* "Solid" Rock, "Loose Rock," and "Earth," quantities being revised.—Cost to complete with *Trestle-work*.	
			Quantities.	Amounts.
		$ cts.		$ cts.
Clearing	per acre.	30 00	500	15,000 00
Close cutting	do	50 00	20	1,000 00
Grubbing (including side ditches)	do	80 00	50	4,000 00
Solid rock excavation	p. cub. yd.	2 75	525,646	1,445,526 50
Loose rock excavation	do	1 75	30,000	52,500 00
Earth excavation (including borrowing)	do	0 37	224,138	82,931 06
Excavation in off-take ditches beyond Railway limits	do	0 45	20,000	9,000 00
Under Drains	p 1001. ft.	55 00	10,000	5,500 00
Tunnelling for Railway (sectional area equal to 15 cubic yards to the lineal foot)	p. lin. foot.	30 00	425	12,750 00
Twenty feet Tunnels for Streams (12 cubic yards per lineal foot)	do	26 00	200	5,200 00
Sixteen feet Tunnels for Streams (8 cubic yards per lineal foot)	do	18 00	160	2,880 00
Twelve feet Tunnels for Streams (4 cubic yards per lineal foot)	do	14 00	320	4,480 00
Eight feet Tunnels for Streams (2 cubic yards per lineal foot)	do	9 00	450	4,050 00
Six feet Tunnels for Streams (1 cubic yard per lineal foot)	do	7 00	1,300	9,100 00
Bridge Masonry	p. cub. yd.	11 00	2,400	26,400 00
Crib-work in abutments and piers of bridges (including timber and stone filling)	do	2 75	380	1,045 00
Rip-Rap	do	2 00	1,000	2,000 00
Bridge Superstructure—Timber—40 feet span	per span.	600 00	1	
Square Timber—16 in. by 12 in.	per lin. ft	0 33	500	165 00
do 15 in. by 12 in.	do	0 30	84,000	25,200 00
do 15 in. by 9 in.	do	0 30	84,000	25,200 00
do 12 in. by 12 in.	do	0 30	1,000	300 00
do 12 in. by 9 in.	do	0 28	20,000	5,600 00
do 12 in. by 6 in.	do	0 28	140,000	39,200 00
do 9 in. by 9 in.	do	0 25	245,000	61,250 00
do 9 in. by 8 in.	do	0 25	225,000	56,250 00
do 6 in. by 4 in.	do	0 20	81,000	16,200 00
Piles, driven	do			
Round Timber, of size to square—12 in. by 12 in.	do	0 18	260,000	46,800 00
do do 12 in. by 10 in.	do	0 17	44,000	7,480 00
do do 12 in. by 9 in.	do	0 17	16,000	2,560 00
do do 12 in. by 6 in.	do	0 12	81,000	9,720 00
do do 12 in. by 4 in.	do	0 10	14,000	1,400 00
do do 9 in. by 9 in.	do	0 12	74,000	8,880 00
do do 9 in. by 6 in.	do	0 10	158,000	15,800 00
do do 9 in. by 4 in.	do	0 08	15,000	1,200 00
do do 6 in. by 4 in.	do	0 06	29,000	1,740 00
3 in. Flatted Timber	do	0 12	1,000	120 00
Hemlock or Spruce Plank	p. M. b. m.	12 00	645,000	7,740 00
Carried forward				

RAILWAY.

FIFTEENTH CONTRACT.

Quantities except in the case of "Solid" and "Loose Rock," and "Earth," these "Earth Banks" substituted for "Trestle-work," as recommended in the letters of May, 1878.

Revised Quantities. Trestle-work abandoned.—Cost to complete with *Earth.*		Difference due to substitution of Earth for Trestle-work.		Difference due to minor changes.		Remarks.
Quantities	Amounts.	Increase.	Decrease.	Increase.	Decrease.	
	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.	
554 56	16,636 80			1,636 80		
20	1,000 00					
50	4,000 00					
525,646	1,445,526 50					
50,000	52,500 00					
1,657,420	613,245 00	530,313 97				A
15,000	6,750 00				2,250 00	
5,000	2,750 00				2,750 00	
376	11,280 00				1.470 00	
200	5,200 00					
					2,880 00	
200	2,800 00				1,680 00	
520	4,680 00			630 00		
1,460	10,220 00			1,120 00		
2,400	26,400 00					
100	275 00				970 00	
1,000	2,000 00					
			165 00			
			25,200 00			
			25,000 00			
60,414	18,124 20	17,824 20				B.
9 06	263 08		5,346 32			
			39,200 00			
36,810	9,202 50		52,047 50			
14,680	3,670 00		55,550 00			
4,354	870 40		15,929 60			
3,100	1,500 00	1,500 00				B. No price in Contract. Estimated at 50 cts per lineal foot, which is the contract rate on Contract fourteen.
			46,800 00			
			7,480 00			
			2,560 00			
			9,740 00			
			1,400 00			
			8,800 00			
			19,800 00			
			1,200 00			
			1,710 00			
			120 00			
			7,740 00			

FIFTEENTH CONTRACT.—Approximate Estimate of Cost to complete, according

Description of Work.		Contract Rates.	*Schedule Quantities.* "Solid" Rock, "Loose" Rock, and "Earth," quantities being revised—Cost to complete with *Trestle-work.*	
			Quantities.	Amounts.
		$ cts.		$ cts.
Brought forward				
Pine Plank	f. p. M. b. m.	25 00	1,000	25 00
Hardwood Plank	do	20 00	1,000	20 00
Wrought Iron, including bolts, spikes, straps, &c	per lb.	0 13	325,000	42,250 00
Cast Iron	do	0 10	10,000	1,000 00
Ties	No.	0 40	270,000	108,000 00
Track-laying	per mile.	290 00	116	33,640 00
Ballasting	p. cub yd	0 33	186,000	61,380 00
Points and Crossings	sets.	10 00	26	260 00
Additional Masonry and Permanent Structures, say				
Totals				2,267,942 56
Approximate additional cost of "earth" substituted for "trestle-work"				

NOTE.—The items marked A, B., C., are increases caused by the substitution of Earth for Trestle- is $361,856.61. Deductions, due to changes in other items, bring the Estimate down to the amount Estimate, of the probable increased cost of completing with Earth, to Mr. Fleming, I did not make these

OTTAWA, 10th April, 1879.

to Contract, or with Earth Banks substituted for Trestle-work.—*Continued.*

Revised Quantities. Trestle-work abandoned.—Cost to complete with *Earth.*		Difference due to substitution of Earth for Trestle-work.		Difference due to minor changes.		Remarks.
Quantities	Amounts.					
	$ cts.	$ cts.	$ cts.	$ cts	$ cts.	
.....	.....	.....	.....	.....	.....	
15,578	389 45	.....	.....	.....	.....	B.
3,680	73 60	364 45	.....	.....	.....	B.
26,937	3,501 81	.....	38,748 19	.....	.....	
18,885	1,288 50	288 50	.....	.....	.....	B.
270,000	108,000 00	.....	.....	.....	.....	
116	33,640 00	.....	.....	.....	.....	
186,000	61,380 00	.....	.....	.....	.....	
26	260 00	.....	.....	.....	.....	
.....	70,000 00	.....	.....	.....	.....	C.
.....	2,517,417 84	550,314 72	361,856 61	3,386 80	12,400 00	
	2,267,942 56					
.....	249,475 28	.....	.....	.....	.....	

work, and total $620,344.72. The amount of timber-work done away with, from the same cause, given above, $249,475.28. But, in order to be sure I was on the safe side when submitting my Deductions, hence the sum given in my letter to him of the 22nd May, 1878, viz: $258,500.—J. H. ROWAN.

JAMES H. ROWAN,
District Engineer.

Q. What is the estimate cost according to the contract?—$2,267,942.56.

Q. What is the estimated cost supposing earth is substituted for trestle-work?—$2,517,417.84, showing that the excess of cost if earth is put in instead of trestle-work, would be $249,475.28. I thought it was but right I should make a short statement in connection with that, and which I have written as a note at the bottom of this schedule.

(*Vide* "Note" at end of foregoing schedule.)

Q. I should like to know to what extent the change you have made there has increased the quantities of work?—None at all, so far as I know. Of course loose rock is an uncertain quantity, but the solid rock remains unchanged whether you put in trestle-work or whether you put in earth-work. It is the earth-work that will be changed, if you abandon the trestle-work, and I can answer you here right off, what the change in that respect would be. Under the contract, the quantity of earth would be over 24,138 yards, and if trestle-work is abandoned all through the contract, and changed from the original plan, the quantity of earth would be 1,657,420 yards. The difference in money would be from $84,931.06 to $613,245.

Q. So that if there had been no change made in the mode of construction, the earth would have increased over the estimated quantity of 80,000 yards to 224,138 yards?—Yes.

Q. That is adhering to the trestle-work system?—Yes.

Q. But if the solid bank mode should be adopted, it would be increased to 1,657,420 yards?—Yes.

Q. Can you give us the same statement with respect to rock excavation. The quantity in the original schedule was 300,000 yards?—Yes.

Q. If there had been no change in the mode of carrying on the work, what would have been the quantity of rock as now estimated?—The quantity would have been 525,646 yards of solid rock if there had been no change. And if solid embankments should be adopted, the quantity will be just the same. Whether the banks are made of trestle-work or solid earth, it makes no difference in the quantity of rock.

Q. How is loose rock?—The loose rock is not changed either. Nothing was known as to the quantity until we came on it. It is estimated at 30,000 yards.

Q. It is estimated in the revised estimate at 46,000 yards. Can you explain that?—It is because we have got an increased quantity.

Q. Is the item 46,000 yards in the revised estimate correct?—No, there will be more. It will be largely in excess of that, and it is due to other causes.

Q. When was it first expected that there would be a change made in the character of the construction of the work?—I think the first time it was expected was when I explained to Mr. Smith what my views were on the subject, and endeavored to lay before him the general advantage that there would be in the substitution of rock sides instead of building rock bases, when he was in Winnipeg in October, 1877.

Q. At the same time it was proposed to carry these solid embankments across the dry voids?—That was subsequent to Mr. Smith's approval of making the banks across the water voids. The embankments across the water-voids were approved of first of all, and then the proposition was made by the contractor to do away with trestle-work eveyrwhere, and that if we would follow that plan of construction he would furnish the material, no matter how far he had to haul it, free of extra cost. He was asked to submit that in writing, which he did.

By the Honorable Mr. Cornwall:—

Q. That proposition was made in Mr. Smith's presence?—Yes; it was made to him in my presence in Manitoba.

By the Honorable Mr. Macpherson:—

Q. Was it generally expected that the change would be made?—Yes. I have no hesitation in saying I was in great hopes that the change would be made.

Q. Can the embankments with rock side walls be rendered solid if the trestle-work is adhered to?—It would be necessary to fill up the centre to the level of the rock walls with earth and place the trestle-work on that. I would be very much afraid, however, that if we did so that the earth would settle with the water, and the trestle-work would not have a solid foundation. This might be obviated by putting in piles and placing the trestle-work on the piles.

Q. Has the original plan been modified to any considerable extent by filling the land voids with rock?—No, it has not. The only place that is done is where Mr. Smith gave orders that we should make up the bank at one point with earth, because it would serve I think, if I remember right, to afford us data to estimate whether there was the quantity of earth material in that district that we required by opening up a borrow-pit.

Q. So the quantity of trestle-work would not be reduced by anything that has been done in the way of filling up the land voids?—It will be reduced by filling up the water voids but not by filling up the land voids.

Q. To what extent will it reduce it by filling up the water voids?—It will make a large reduction.

Q. One-half?—I should think it would be fully that, if not more.

Q. If the quantities had been correct as detailed in the original estimate or schedule, which mode of construction would have been least costly—adhering to the trestle-work, or adopting solid embankments?—Of course the trestle-work would be the cheaper by the amount I have given to-day.

Q. Is it the fact that the quantities have been so much increased beyond what was estimated that renders it desirable to adopt the solid plan?—No, I think not.

Q. Is it not the additional material from cuttings that affords the material for the solid embankments?—You are partly right in this way: It is the additional quantity of earth we have. We have found large deposits of earth where we never expected to find earth on the contract at all. You see when we put in the first estimate of 80,000 yards, it was thought that the whole country was rock; but since the fact was ascertained that there were large deposits of earth, then the whole character of the work was changed to a certain extent, and it became a question whether it was not more desirable to put in earth-work than trestle-work. It is my impression if it had been known at first that such large quantities of earth existed there, it would have made a difference in the kind of work adopted.

Q. Have the engineers furnished bills for the trestle-work in the dy voids?—The The engineers have not furnished them yet.

Q. Do you furnish them, or do you wait to be asked for them?—We wait until the contracrtors ask for them. If we volunteer them before they are required, they are sometimes lost.

Q. Can you give us some idea of the depths of the lakes that have to be crossed?—They are large lakes, but we always cross them at favorable places.

Q. What is the longest crossing you have?—I do not remember exactly, but I think 500 or 600 feet—possibly 700 feet.

Q. What is the greatest depth you have to contend with?—I think, of water, about 20 feet.

Q. And how is the bottom?—In some cases it is hard, and in others it is soft mud.

Q. Is there much of soft mud?—In Cross Lake there is a considerable amount of mud. We have been making borings for some time, and the depth is 20 feet or more.

Q. Will you have to build bridges over any portion of them?—I think not; I have received orders from the Acting Engineer-in-Chief to build trestle-work over one; to put in a solid rock base instead of sides; and to put trestle-work over one.

Q. What are the conditions of the contract with respect to haul?—Anything over 1,200 feet, the contractors have to be paid for over haul.

By the Honorable Mr. Haythorne:—

Q. To what extent would the change benefit the contractor?—I can answer

generally. It would avail to him, that whatever you consider the price, that 37 cents per cubic yard for earth is above what would be a fair price on the difference of 234,138 yards and 1,657,420. The rock, whether solid or loose, is not affected by the change in any way. Then the contractor advantages by every stick of low-priced timber that is left out.

Q. You speak of earth being more easily obtained than was anticipated?—Yes.

Q. Do you get the earth you wanted in the cuts, or has it to be borrowed?—The major portion of it would have to be borrowed.

Q. What is the nature of the soil?—It is a sandy soil.

By the Honorable Mr. Macpherson:—

Q. How long would the haul be?—In some cases very long.

By the Honorable Mr. Haythorne:—

Q. Is the soil calculated to make good solid embankments, and bind well?—I think so.

Q. You are not afraid of subsequent subsidence in the lakes, if you fill in between side walls with earth?—No; I think the rock sides will thoroughly protect it against subsidence. It has taken such an immense quantity of rock to make those side walls, as compared with what the depth of water and mud showed it to be, that I am satisfied the rock has gone down and obtained a solid hold on the bottom, so that there is no danger of the walls spreading when the earth is put in. The rock walls have gone down at a slope of two to one, instead of one to one, and consequently have found a very firm basis for the subsequent earth filling.

By the Honorable Mr. Macpherson:—

Q. The chief cause of the increased cost is the increase of quantities over the schedule quantities?—Yes.

Q. And that the surveys were not sufficiently advanced to enable you to take out the exact quantities?—No.

Q. I suppose all parties on the line, engineers and contractors, have been expecting that the proposed system would be the one adopted?—Yes; we have hoped so, because we thought that it was the best. I now produce the letter of instructions that I wrote to the division engineer on the departure of Mr. Smith:—

Copy.

WINNIPEG, 3rd November, 1877.

DEAR SIR,—I am in receipt of yours of the 28th October. Mr. Smith left for the east yesterday afternoon. He will submit the whole question of making up the banks with earth, and doing away with trestle-work, to the Government.

In the meantime he has authorized me to have the banks across lakes made up in the manner we proposed—that is with a narrow rock bank on each side, brought up to 3 feet over high water level, placed wide enough apart to carry the sand embankments, and leave a berm of 2 feet outside. I shall telegraph you to this effect so soon as the line is working.

The area of the section for tunnel I sent you, was about 3 feet in excess of that of a 12 feet circle. I now enclose you one which will be the same (and from which you will work), or so near as to be practically the same. You will return the quantities as per this section.

The contractor must furnish stringers in accordance with the drawings.

Truly yours,

(Signed) JAMES H. ROWAN,

H. CARRE, ESQ.,
Division Engineer, Contract 15.

Q. Did you send a copy of this to Mr. Smith ?—In my subsequent letter to him I made extracts from it. Then on the same day I wrote a further letter to Mr. Carre to this effect :—

WINNIPEG, 3rd November,

DEAR SIR,—Mr. Whitehead is anxious to submit a proposition to the Government, whereby he will be permitted to make up all the embankments on Contract 15 with earth or sand filling in lieu trestle-work.

He, together with his engineer (Mr. Ruttan), had a short interview with Mr. Smith on the subject yesterday, just as he was leaving. Mr. Smith seemed to favor the proposal, but before submitting it to the Government requires some more detailed information on the subject—made up under the following heads, giving the quantities and cost as near as possible :—

1st. The cost of completing the line according to the present design.

2nd. The cost of same substituting earth or sand filling instead of trestle-work.

3rd. Cost of completing line as at present contemplated and subsequent filling in of trestle portion, with earth or sand.

Note.—All items, such as masonry, bridging and stream tunnels, &c, &c., which would be common to all three plans, may be disregarded in the calculations, or better still, given in a bulk sum common to all three.

The estimate under the first head should show the quantity and cost of rock in line cuttings, and such clay or sand as is contained in the same, together with sand and clay which can be easily obtained by borrowing, and the quantity and cost of the trestle-work required to fill up the ungraded portion remaining after this is done; the line, as regards grading, being considered completed under the present contract when this is done.

The estimate under the second head will show the cost with the trestle-work done away, and earth or sand substituted. It being distinctly understood that if this plan is adopted the contractor will make no charge for extra haul, no matter what distance he may have to carry the material to make up his banks, nor for putting in a narrow rock bank on each side of the sand fillings across water-stretches. If trestle-work must be retained at some points, you will bear in mind that it will prove most economic in high banks at points other than water-stretches.

The estimate under the third head explains itself. I have not yet the necessary data, in the shape of longitudinal section, cross-sections, &c., furnished me by you, to enable me to have the estimates made here; you will therefore have to prepare and forward them to me, as it is very important that I should have this information at the earliest practicable date. Mr. Ruttan, who takes this out, has kindly, at Mr. Smith's suggestion, undertaken to render you all the assistance in his power to make them up, and you can keep Mr. Rodger, who accompanies him, to assist you, and after that he will rejoin Mr. McNab.

Mr. Smith has authorized me to permit the contractors to put in the double rock banks across the water-stretches to be filled in between with sand, top to grade with sand, when such a course is practicable and desirable. Where there is enough rock at hand for a full rock bank over water-stretches this course can be followed.

Mr. Smith has consented to the grade being lowered somewhat between stations 1,230 and 1,330—say something like three feet, or thereabout, at the summit at station 1,280—if you think the same can be done with advantage.

Mr. Ruttan reports that there will only be rock enough in the cuts at the west end of the contract to make one of the rock sides to the embankment across "Cross Lake." Mr. Smith has authorized the lowering of the grade through them and over Cross Lake, to such an extent as will permit sufficient rock from the cuts to make up the rock bank on the other side.

There must be a clear understanding with the contractors as to the fact that if consent is given as to earth filling in lieu of trestle-work, all the banks must be co

made up, or at least those that the Engineer may order to be done, and not those that he, the contractor, may select.

Truly yours,

(Signed) JAMES H. ROWAN.

H. CARRE, Esq.,
Division Engineer, Contract 14.

I came down to Ottawa about the first of January, but as I had not heard of anything being done in the matter I submitted a letter again to Mr. Smith, of which this is a copy:—

OTTAWA, 5th March, 1876.

DEAR SIR,—Early last November Mr. Whitehead had a conversation with me, in reference to being permitted to make up the embankments on Contract 15 with earth or sand in lieu of trestle-work. I requested him to put his proposition in writing, in order that I might submit it to the Department through you; about the same time I wrote to Mr. Carre (5th November, 1877) requesting detailed information on the subject, which I could submit at the same time; my letter to him was as follows: "Detailed information on the subject, made up under the following heads, giving the quantities and cost as near as possible.

"1st. The cost of completing the line according to the present design.

"2nd. The cost of same, substituting earth or sand filling instead of trestle-work.

"3rd. Cost of completing line as at present contemplated, and subsequent filling in of trestle portion with earth or sand.

"Note.—All items, such as masonry, bridging and stream tunnels, &c., &c., which would be common to all three plans, may be disregarded in the calculations, or, better still, given in a bulk sum common to all three."

"The estimate under the first head should show the quantity and cost of rock in line cuttings, and such clay or sand as is contained in the same; together with sand and clay which can be easily obtained by borrowing, and the quantity and cost of the trestle-work required to fill up the ungraded portion remaining after the above is done. The line, as regards grading, being considered completed under the present contract when this done."

"The estimate under the second head will show the cost, with the trestle-work done away and earth or sand substituted."

"If trestle-work must be retained at some points, you will bear in mind that it will prove most economic in high banks at points other than water stretches."

"The estimate under the third head explains itself. I have not yet the necessary data, in the shape of longitudinal and cross-sections, &c., furnished me by you, to enable me to have these estimates made in my office. As it is very important that I should have this information at the earliest practicable date, you will, therefore, prepare and forward it to me."

"There must be a clear understanding with the contractors, as to the fact, that if consent is given for earth filling, in lieu of trestle-work, all the banks must be so made up, or at least those that the engineer may order to be done, and not those that he, the contractor, may select."

On the seventh November last, I received the enclosed letter from Mr. Whitehead, making a formal proposition in connection with this subject.

Before leaving Winnipeg, to come down here, I again wrote to Mr. Carre (17th December), informing him that I had received this letter and added: "Before, however, I can submit this to the Department I must be in a position to lay before it an approximate estimate of the cost of both ways of doing the work." Hence my letter to you of the 3rd November.

"Mr. Marcus Smith having approved of the plan for making the banks across water-stretches, with rock sides to be filled in with earth and sand, these are now

estimated from the calculation for trestle-work, and I shall be obliged by your letting me have an approximate estimate of the other portions, at the very earliest practicable moment. The object of such estimate being to show the respective cost of filling in the openings in the banks, for which there is now no material, in the first place with trestle-work which will be subsequently filled in with earth and sand. And, the cost if now filled in with these materials at the contract price, the trestle-work being abandoned either altogether or as far as practicable."

I may here call your attention to the fact that, while it will be necessary in all cases to have the superstructure of the trestle-work made of the best squared timber, a considerable portion of the timber to be used in the "bents" may be round; only squared at joints, mortices, and tenons, thereby materially reducing the cost (at cost rates).

Mr. Carre promised to let me have the information asked for in these letters before this date, but as I have not yet received it, I now hand in Mr. Whitehead's letter, with such information bearing on the subject as I am in a position to give at present; I may hear from him within the next few days, and then be in a position to give you further information.

The present grades on Contract 15, in their relation to the cuts and fills, were adopted with a view to keeping down the first cost, by reducing the rock cuttings. The material taken from these to be used in the first place, where necessary, for bringing up the banks across lakes and bays to three feet above high-water level, and of such a width that, at some future date, earth embankments could be formed upon them without the toe of the latter being in the water.

In the meantime trestle-work, placed upon these rock banks, would carry the track over these uncompleted banks, and at other points where sufficient material could not be obtained to make them up.

It was decided to make the rock banks as above described, to prevent the timber work in trestles from being acted upon alternately by air and water; and of that width, in preference to narrower (only sufficient to carry the trestles) as, had this latter plan been adopted, more earth would be required to complete them subsequently; and, after completion, rock would have to be procured for rip-rap at their base, to preserve them from the action of the water.

At the time when it was determined to adopt the plan above stated, all the information which had been obtained, lead to the belief that very little material other than rock could be procured on the section. During last summer, however, the men and tools, &c., required for making examinations, being on the ground, it was ascertained that a considerable quantity of sand and clay could be obtained at some points on the line and from borrowing pits. To place this in the works, however, a very considerable length of haul will, in some instances, be necessary.

That this discovery has a most important bearing upon the method of constructing the work previously determined on, the accompanying diagrams and calculations prove, as they show that—

1. Earth embankment is cheaper than trestle-work for banks of less than 18 feet in height;

2. If a rock base of full width, for subsequent earth bank on top, is more than half the total height of the bank, a rock bank made up to grade would be less expensive;

3. A rock base on rock sides, less than 10 feet in height, will not reduce the cost of constructing an embankment;

4. Rock sides (as in Figure 1) filled in with earth to full height of embankment, is in all cases at least 33 per cent. cheaper than a full width rock base with trestle-it, and nearly 50 per cent. cheaper than this same bank with earth filling work upon upon it;

5. Banks between 20 and 50 feet in height, will ultimately cost from 57 to 09 per cent. more, if crossed in the first place by trestle-work and subsequently filled in with earth, than if made up with earth now.

These facts are arrived at from the following data:—

1. The rates at which the cost of the different classes of works are calculated are those of the contract, with the exception of "subsequent fillings in earth when trestle-work is used in the first place;" this is calculated to be done at 20 per cent. less than the contract price for earth filling.

2. Earth slopes are taken at $1\frac{1}{2}$ to 1; rock slopes at 1 to $\frac{1}{4}$.

3. Rock in *situ* is to rock in bank as 2 to 3.

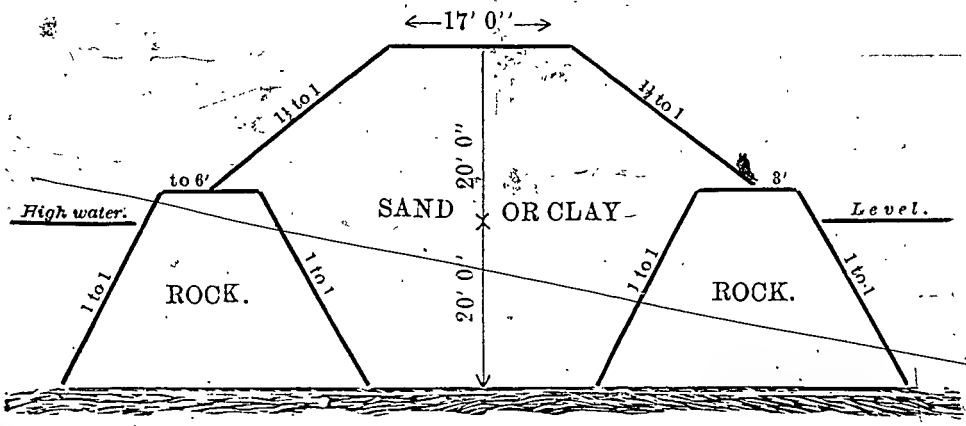
4. Earth in *situ* is to earth in bank as $1\frac{1}{9}$ to 1.

5. Round timber, or the lowest priced, is supposed to be used in all "bents;" square timber, or the highest priced, is supposed to be used in all "superstructure."

6. Keeping the five heads above in view, the relative cost is, per lineal foot:—

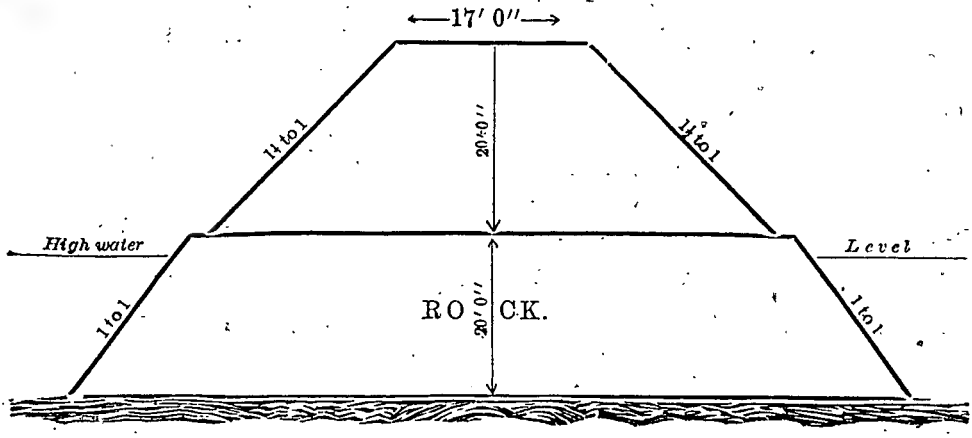
Trestle-work.	Earth bank.	Rock bank.	Height of embankment.
$10 02	$4 25	$18 30	10 feet
10 96	14 27	50 16	20 do
13 38	28 24	95 56	30 do
16 25	46 76	154 52	40 do
20 38	69 84	227 04	50 do
21 18	110 70	353 39	65 do

Figure No. 1.



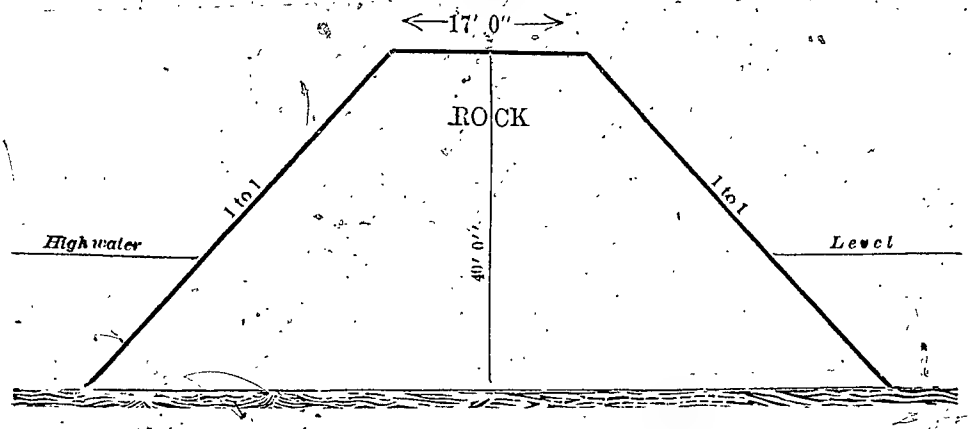
Rock sides, earth core and top cost per lineal foot.....$100 25

Figure No. 2.



Rock base and trestle-work top cost per lineal foot	$150 57
do and earth do do	153 59
do and trestle work with subsequent earth filling per lineal foot	162 41

Figure No. 3.



Full rock bank, cost per lineal foot	$154 53

A 20 feet bank will cost per lineal foot:—

1. If earth with rip-rap sides 10 feet high	$20 28
2. If sides rock (as Fig. 1) 10 feet high, core and top earth	31 26
3. If base rock (as Fig. 2) 10 feet high, top earth	47 55
4. If all rock (as Fig 3)	50 16
5. If base rock (as Fig. 2) 10 feet high, top trestle-work	52 71
6. If do do do top trestle-work with subsequent earth filling	56 74

A 30 feet bank will cost per lineal foot:—

2. If sides rock (as Fig. 1) 20 feet high, core and top earth	81 73
2. If all rock (as Fig. 3) 20 feet high	95 56
3. If base rock (as Fig. 2) 20 feet high, top earth	103 80
5. do do do top trestle-work.	108 97
6. do do do top trestle-work, subsequent earth filling	113 00

A 40 feet bank will cost per lineal foot:—

2. If sides rock (as Fig. 1) 20 feet high, core and top earth	$100 25
5. If base rock (as Fig. 2) do top trestle-work.	150 57
3. do do do top earth	153 89
4. If all rock (as Fig. 3) do	154 53
6. If base rock (as Fig. 2) do top trestle-work with subsequent earth filling	162 41

A 50 feet bank will cost per lineal foot:—

2. If side rock (as Fig. 1) 20 feet high, core and top earth	$123 34
5. If base rock (as Fig. 2) do top trestle-work.	193 67
3. do do do top earth	208 54
6. do do do top trestle with subsequent earth filling	217 09
4. If all rock (as Fig. 3)	235 05

A 70 feet bank will cost per lineal foot:—

2.	If sides rock (as Fig. 1)	20 ft. high,	core and top earth.	$183 06
5.	If base rock (as Fig. 2)	do	top trestle-work ...	281 94
3.	do	do	top earth	331 47
6.	do	do	top trestle-work, subsequent earth-filling.....	339 86
4.	If all rock (as Fig. 3).....			412 77

Having set before you in general terms, when in Winnipeg, the facts which are here given in detail, I received permission to make the necessary changes in the method of constructing the banks across water-stretches. Consequently, in one or two cases where sufficient material is found in cuttings, close at hand, to make an all rock bank instead of an all rock base (the cost being nearly the same). This course is being followed. In others, rock sides are being made, facilitating the completion of the work, the material for this purpose being obtained from cuttings close at hand, while, to make a full rock base, it would have to be hauled a considerable distance, in some instances.

Trestle-work built of the timber of the country could not be considered safe after it had been in the work five or six years; and the danger of traffic on the line being interrupted at any moment through the destruction by fire of some portion of the great length required on this section, cannot be over-estimated.

The danger from this cause is considerably reduced by the plan now adopted for crossing water-stretches, and would be entirely removed, if the enclosed proposal is accepted; while, at the same time, the character of the line would be more permanent.

In my letter to you of the 26th January last, I called attention to the fact that there are points on the line where the introduction of structures of a permanent character, for which there is no contract price, would do away with high and perishable trestle-work. As the doing away with trestle-work will, no doubt, be of pecuniary advantage to the contractors, I would recommend that they should be called upon to put in structures, where required, either of the character named in that letter or any other kind of culvert-masonry, at rates proportionate to that given in their tender for bridge masonry, and this in addition to the offer contained in the enclosed letter.

By adopting this course, the whole work will be made of a permanent character, the first cost not increased materially, while the ultimate cost would be materially decreased.

Yours truly,

JAMES H. ROWAN.

MARCUS SMITH, Esq.,
Acting Engineer-in-Chief.

By the Honorable Mr. Cornwall :—

Q. That letter was addressed to Mr. Marcus Smith while he was Engineer-in-Chief?—Yes; that was submitted a year ago last March, before Mr. Fleming came out from England.

By the Honorable Mr. Macpherson :—

Q. To that latter you got no reply?—No; I received no reply. I have here a copy of a telegram respecting changes which Mr. Smith suggested, and which have materially improved the line.

(Copy.)

OTTAWA, December 28th, 1879.

JAS. H. ROWAN,
Winnipeg.

War Eagle, Rock Lake.—Make solid rock embankment to 3 feet above water; 42 feet wide at top; trestle superstructure, outside post raking 3 inches per foot. Lake Deception.—Earth embankment with rock protection in water in the approved form.

(Signed) MARCUS SMITH.

Mr. Marcus Smith asked to be allowed to make a few explanations. He said:—The work Mr. Rowan alludes to, as done in 1877, was a portion that was submitted to me for my approval just as I was leaving Winnipeg, and it was about two miles in length. It was a change in the distribution of the rock taken from the cuttings from what Mr Fleming had authorized Mr. Rowan to do. Mr. Fleming had authorized Mr. Rowan to made solid embankments across the water-stretches. We found that would take a large quantity of rock, and Mr. Rowan submitted a plan to make narrow protection walls at the side so as to save borrowing rock, and which would require far less material. I approved of that so far as that portion of the work that was submitted to me is concerned, and I approved of certain lowering of grades there, but I gave no instructions, and gave Mr. Rowan no authority to write to Mr. Carre that that was to be the general character of the work. I gave him instructions to make detailed profiles and plans of any changes that were proposed to be made. I have a great objection to approving of things generally before having the plans and profiles before me.

By the Honorable Mr. Macpherson:—

Q. You mean that he was not to apply that to any water-stretches except what you had approved of?—Except to the smaller water-stretches.

Q. Your instructions to Mr. Rowan were verbal and not in writing?—They were verbal; made just as I was hurriedly leaving Winnipeg. Had I seen the letter that Mr. Rowan wrote to Mr. Cane with respect to the distribution of rock, I would not have objected to it, because I think it was so far correct.

By the Honorable Mr. Cornwall:—

Q. How is it you did not recollect this before Mr. Rowan came here?—I was not asked the question. I was specially instructed by the Government not to volunteer any information. If you had asked me to give a narrative, I should have done so.

By the Honorable Mr. Haythorne:—

Q. I should like to ask whether it is the custom in the Department to give verbal directions with reference to changes as important as this?—Not for general changes, but for a small change such as this is. I should have given written instructions, but I had not half an hour before the boat left. I mentioned to the Minister, when I returned to Ottawa, that I had authorized some changes on the line which were within the province of the engineer. I said they were of such a character as would reduce the cost of the work, and he rather approved of it.

By the Honorable Mr. Haythorne:—

Q. Was a change over two miles of the road a small matter?—It was a small matter as compared with the general change over the section.

Q. Do you not think that, having no time to do so before leaving Winnipeg, it would have been better to have given a written authority subsequently? The only notice we have of this change is entirely through Mr. Rowan's letter to Mr. Cane?—I generally give written instructions if I am writing from Ottawa, but on the line I give verbal instructions as I go along to the engineer in charge.

Q. Is there any written record of the instructions to be found anywhere?—No. These are practically details that do not require to come before the Department at all.

By the Honorable Mr. Macpherson:—

Q. In answer to the question of Mr. Christie: "Is it usual to call for new tenders when changes are made in the works under contract?" you replied: "I never knew changes of such magnitude being made without tenders being called for. This is a total change in the character of the work, you must understand?"—I do not know that I ever did. I do not remember such radical changes ever having been made in works I have had to do with.

Q. But according to Mr. Rowan's evidence no very radical changes have been made. The quantities have been increased because the first estimate was renounced?—I think a change involving $260,000 is a considerable change.

Q. Did not the increase of quantities of material which were discovered provide the means of making those changes, and under the circumstance were they not advisable?—As an engineering question they were advisable, as I certainly prefer embankments to trestle-work.

Q. But had not the materials to be removed in any case?—No; we had to borrow material to make up the embankments in many cases.

Q. There is an increase of 225,000 yards of rock that had to be disposed of?—If there is sufficient rock in the cuttings to make these protection walls, there would be no advantage either way; but if they have to borrow rock to make these protection walls that would, of course, increase the quantity. I may say that, in the future, if it is not intended to renew the trestle-work after it decays, but to fill it up with earth, then these embankments would be required; but they are not required at present if the trestle work is adopted. There would be no necessity for borrowing rock at present, as the protection walls might remain uncompleted until they were required for solid embankments. If you will allow me to explain about that letter of Mr. Rowan's of the 5th of March:—I was exceedingly busy at the time it was received; Parliament was sitting, and I had papers piled up before me in my basket that I had to take up *seriatim*, and I could not do more than glance at it; but, even if I had had time, I could not go into a question for which there did not seem to be sufficient data, and I have found since, in going over it, that I could not have answered the question satisfactorily without going over the line myself. It is very difficult to apply any general system to difficult works like this, and I would not commit myself to any general plan without more data.

By the Honorable Mr. Cornwall:—

Q. Were these your reasons for inducing the Committee to believe that you knew nothing about this work until you went on the section?—I knew nothing about what was going on in the Department, and I did not try to induce the Committee to believe anything. I simply answered the questions as straightforwardly as I could.

Q. Have you read Mr. Mackenzie's evidence?—I have not.

Q. He swears positively that you must have known all about those changes?—Mr. Mackenzie must know better what I know than I do myself.

By the Honorable Mr. Haythorne:—

Q. On referring to your former evidence at page 19, there appears to be some discrepancy between your answer to Mr. Christie's question and Mr. Rowan's evidence, given on a former occasion, in which he states that the alterations had not been commenced beyond what had been authorized by yourself in the autumn of 1877?—The rock embankment would necessarily be the work that had to be done first; and when I went over it there were several embankments being made with earth that I understoood had been originally estimated as trestle-work, and the contractor told me he was preparing plant, that is steam-engines and steam-shovels to do a very large quantity of earth work. But at that time there was not a great quantity done, although they were going on with it all the same.

By the Honorable Mr. Cornwall:—

Q. Mr. Rowan said distinctly that on his return from Ottawa in the early part of last summer the contractor was going on, carrying out Mr. Smith's authorized changes, and so they have been going on to this day; no changes have been made beyond those authorized by Mr. Smith?—In reply to that I state I authorized no changes but those I gave when I was leaving Winnipeg.

Q. Do you not think it is possible that you have forgotten what you authorized in the same way you have forgotten the proposal made to you by Mr. Rowan?—I do not forget a thing I have authorized; I did not authorize even so much as that. authorized a special piece of work that was submitted to me, and if any more changes were required I instructed them to send me plans and profiles for my approval.

Q. Why did you not refer the matter to the Government as you promised to do?—Refer what matter?

Q. The proposed change? —Mr. Whitehead and Mr. Rowan proposed no change to me except the two miles that I have spoken of.

Q. Then it remains with the Committee to decide whether they will believe you or believe Mr. Rowan?—I submit there was no general change authorized at all.

By the Honorable Mr. Haythorne:—

Q. I wish to ask you whether the work you saw in progress was adopted for finishing that earth-work or trestle?—It was adopted for finishing with earth work. It would not have been required for trestle-work at all. But trestle-work was not intended to be the final form of the railway. It was only intended to be used first, and then when the trestle-work decayed to fill it up with earth. These rock embankments I approved of because they were put in the best form for the subsequent filling in with earth.

Mr. HENRY CARRE recalled, was examined as follows:

By the Honorable Mr. Haythorne:—

Q. You heard Mr. Smith's evidence just now?—Yes.

Q. Can you give the Committee any explanations with respect to the nature and extent of these fillings?—You mean the land fills?

Q. Yes?—Well, of course, we were working at the time Mr. Smith came up, at nothing but the actual line cutting, except in one or two little points where we got into sand, and a nose of rock which the contractor would have had great difficulty to cut; but I allowed him to go a little to one-side and make a little borrow, quite enough to allow his track to pass. Except that and the taking out of side ditches to make banks where the cut did not give sufficient material, there was no borrow or earth excavation except from the line cuttings. You see in cases where there was a shallow dump to be made, and the ditch long, we widened the ditch to get enough material out of it to make the dump. This is a portion of the work under the contract, it is not outside the terms of the contract at all. There is no change at all. Mr. Smith did not mention the stations at which the changes occurred. I should like to ask him where they occured, as I think he must be mistaken. He authorized one embankment to be made up from a borrow pit, as Mr. Rowan states.

Q. Did you consider at the time of his visit that you were working strictly in accordance with the specification?—Yes; in everything except in those protection walls.

Q. And these were authorized on a separate occasion?—They were authorized by Mr. Rowan's letter to me.

Q. And all over the section which you were overseeing the work was proceeding strictly in accordance with the specification?—Certainly; as I understand it.

By the Honorable Mr. McLelan:—

Q. Was there any preparation made for continuing with trestle-work?—No.

Q. Can you give any reason for the preparations not having been made?—Because the matter was in abeyance; we were waiting for instructions to have it finally settled as to whether Mr. Whitehead's proposition would be accepted or not, and I do not know to this moment which way the contract is to be finished.

By the Honorable Mr. Haythorne:—

Q. We spoke just now of the period of Mr. Smith's visit of inspection; I wish to ask you now whether, up to the present time, the work has been carried on in accordance with the specification beyond what has been spoken of in connection with the water-stretches?—Except in the one case of the borrow-pit behind my house, it is; we wanted to open that to see how it would turn out. Mr. Smith said: "Make that bank, and we will see how the borrow-pit turns out." We did so, and it is a very important discovery.

By the Honorable Mr. Macpherson :—

Q. Have you not made any of the land-fills yet?—No further than the cuttings will make them; we have a great number of them, but they are all made from cuttings, except in this case where, as I said, it was made from side ditches.

Q. Was that contemplated in the specification?—Yes.

Q. All that has been done would have been executed if it had not been expected that the trestle-work would be dispensed with?—Yes.

Q. You have done no earth work that would not have been done had you been proceeding with the trestle-work as originally specified?—No; except in that case.

Q. What is the extent of that?—I think it is about 44,000 or 45,000 yards.

Q. Was it you that made the returns upon which the original schedule was based?—Yes; I made all the calculations.

By the Honorable Mr. Haythorne :—

Q. What season of the year did you go there?—I began the survey in July, from Rat Portage.

By the Honorable Mr. Macpherson :—

Q. There was no snow on the ground then?—No; but the ground was covered with moss and sticks.

Q. How are you so far out in the quantities?—Because it is impossible to tell what is under your feet in passing through the woods in that country. There may be ten feet or two feet of sand under your feet; but you cannot tell without testing. Then there were no cross-sections taken.

Q. Why did you not take cross-sections?—It was more than I was able to do to run the line alone. I had to do from Rat Portage to Red River in one season, and it was more than I could do and take cross-sections.

By the Honorable Mr. McLelan :—

Q. What year was that?—In 1874.

Q. Was there no other survey made until 1876?—Yes; I made a re-survey in 1876; but the quantities were not calculated.

By the Honorable Mr. Macpherson :—

Q. Were there no cross-sections taken then?—Yes.

Q. Why did you not take out the quantities then?—I had no time. We were just finishing the work then.

Q. What time? Do you mean before the contracts were let?—We were then finishing the re-location, and the cross-sections, but it was not all finished at the time.

By the Honorable Mr. McLelan :—

Q. Did you believe that this change was to be made from trestle-work to solid embankments?—I could not believe either way, because I had no instructions. I expected it would be made.

Q. But there was no preparation made for trestle-work?—No; there was no timber taken out then.

By the Honorable Mr. Macpherson :—

Q. No bills were furnished to the contractor?—No, but they were all ready for him. The country is so broken that every twenty-one feet we have to survey to make the bents to fit the slope of the ground.

By the Honorable Mr. McLelan :—

Q. It has been given in evidence that the prices of rock and earth were very high compared with timber. It is not customary for the engineer to have the highest priced work done first and paid for, without some security that the lowest priced work would be done also?—It is not usual. If you have any doubt at all of the contractor you would force him to do a proportionate amount of each, but if you had faith in the contractor, you would not force him to do the non-paying work first.

Q. Was it on the faith of the contractor or that the change would be made that you allowed the work to go on? If you found no preparation made for trestle-work

was it not your duty to report it to the Engineer-in-Chief?—It was reported in every monthly estimate.

Q. But there was no special attention called to it?—No.

Q. Was it not your duty to call attention to it?—Yes, if I thought the contractor did not intend to carry out his contract.

Q. I ask you whether your faith was in the change being made, or in the contractor? Did you believe the change would be made?—I thought so. I thought it was to the advantage of the work to do so.

Q. Had you any other reason besides your own opinion as to the advantage of the change?—No.

By the Honorable Mr. Haythorne:—

Q. Did you know that the proposal had been made by the contractors?—Mr. Rowan's letter informed me of that fact; that is all.

Q. That was in 1877?—Yes.

By the Honorable Mr. McLelan:—

Q. Mr. Smith made the statement that one of the reasons that led him to suppose that the change was being made was, that no preparation was made for trestle-work. Would an engineer going along the work consider that a reason that the change was being made?—The trestle-work cannot be put up until the dumps are finished. You cannot put up a rough trestle and dump rock against it without knocking it down, and it would put the contractor to great expense. For instance, if you put up a 30 ft. bent and dump large rocks against it, it will knock it down like bowling-pins. Where we have to fill up with rock around these culverts, the rock has to be hand laid around the bents to keep them from being knocked down. It would be a great expense to the contractors to put the bents up first and lay the rock between them.

By the Honorable Mr. Macpherson:—

Q. Has not timber-work been made with a view to carrying out the changed plan?—Yes, at Cross Lake.

Q. That is, at the water crossings only?—Yes; that is the further west.

Q. Is it with a view to water crossings or as to the fills beyond?—It is the water crossings they intend to run the trains over after the bank is partially filled.

By the Honorable Mr. McLelan:—

Q. How far is the track laid on the two sections?—The track is laid by this time I think, over Cross Lake, that is ten chains on Section 15. They are using the track now to run their material over for two miles on Contract 15.

Mr. ROWAN recalled:—

By the Honorable Mr. Macpherson:—

Q. What is the cause of the increase of rock and earth-work on that section over the original estimate?—It is owing to incomplete data. When the quantities were computed, we had only a trial line run over the ground and no cross-sections. The calculations were made from centre heights only.

Q. What was the length of the section?—36¼ miles now. It was longer at first. Permit me to say a word with reference to the statement I have heard now, for the first time, as to what Mr. Smith approved, and what he did not approve. My idea of what he did approve is conveyed in the letters I wrote to Mr. Carre immediately on his departure from Winnipeg, and I recapitulated it to himself in March. He now says that he just glanced at that letter and put it on one side. I was not aware that he had treated my letter in that way, but Mr. Smith explains the reason,—that he was so busy he could not attend to it, and put it aside. I stated at the time that the data were incomplete, but did not feel warranted in withholding Mr. Whitehead's offer any longer. Therefore I put it forward with such explanations as I could then give; but in the beginning of April I received a detailed estimate from Mr.

Carre, and I then mentioned to Mr. Smith that I had the data and was ready to go into the question whenever he liked, supposing that he had already read my former letter.

By the Honorable Mr Cornwall :—

Q. You communicated both orally and in writing?—I wrote on the 5th of March, and sent in the letter that was read to-day, and I now know the reason, for the first time, why Mr. Smith did not answer it,—that he was too busy, and he has forgotten that I mentioned orally to him in the beginning of April that I was ready to go into the question as I had Mr. Carre's estimate. It was not gone into when Mr. Fleming returned from England, and then I submitted it to Mr. Fleming, who looked into the matter and considered it sufficiently important to recommend it to the Government.

By the Honorable Mr. Haythorne :—

Q. Do you consider that the Department is now in possession of sufficient data to come to a conclusion on this point?—I do.

By the Honorable Mr. McLelan :—

Q. What time did you leave Ottawa last spring?—In the latter end of June.

Q. Had you any conversation with Mr. Fleming before he left respecting this change?—Yes.

Q. When you left in June did you leave with the impression that the change was to be made?—I left with the impression that it would be approved.

By the Honorable Mr. Macpherson :—

Q. Had you any conversation with the Minister of Public Works on the subject?—Except what I stated had occurred prior to my statement to Mr. Fleming, but I had none after that.

SENATE COMMITTEE ROOM,
TUESDAY, May 6th, 1879.

Mr. JAMES H. ROWAN re-called :—

I submit an estimate of what I consider it would cost to complete the work with earth as substituted for trestle-work, and I am preparing an estimate of what it will cost to complete it according to the contract :—

APPROXIMATE ESTIMATE of Cost to complete with full earth banks.

Description of Works.		Quantities.	Rates.	Amount.
			$ cts.	$ cts.
Clearing	per acre	170	30 00	6,000 00
Close cutting	do	7	50 00	350 00
Grubbing (including side ditches)	do	35	80 00	2,800 00
Solid rock excavation	p. cub. yd.	516,226	2 75	1,419,621 50
Loose rock excavation, say	do	95,756	1 75	167,573 00
Earth excavation (including borrowing)	do	1,720,714	0 37	636,664 18
Excavation in off-take ditches beyond Railway limits.	do	9,100	0 45	4,095 00
Earth excavation under water	do	1,000	1 11	1,110 00
Under drains	p. 100 l. ft.	3,226	55 00	1,774 00
Tunnelling for Railway (sectional area equal to 15 cubic yards to the lineal foot)	per lin. ft.	515	30 00	15,450 00
Twelve feet tunnels for streams (4 cubic yards per lineal foot)	do	400	14 00	5,600 00
Eight feet tunnels for streams (2 cubic yards per lineal foot)	do	650	9 00	5,850 00
Six feet tunnels for streams (1 cubic yard per lineal foot)	do	800	7 00	5,600 00
Bridge masonry	p. cub. yd.	2,000	11 00	22,000 00
Crib-work in abutments and piers of bridges (including timber and stone filling)	do	1,700	2 75	4,675 00
Rip-rap	do	2,500	2 00	5,000 00
Square Timber—15 in. by 9 in	per lin. ft.	2,304	0 30	691 20
do 12 in. by 12 in	do	61,262	0 30	18,378 60
do 12 in. by 9 in	do	2,932	0 28	820 96
do 9 in. by 8 in	do	23,155	0 25	5,788 75
do 9 in. by 6 in	do	39,955	0 25	9,988 75
do 9 in. by 4 in	do	3,644	0 20	728 80
Piles, driven	do	1,300	0 50	650 00
8 in. Flatted Timber	do	8,564	0 12	1,027 68
Pine plank	p. M. b. m.	28,812	25 00	720 30
Wrought Iron (including bolts, spikes, straps, &c.)	per lb.	45,961	0 13	5,974 93
Cast Iron	do	11,516	0 10	1,151 60
Ties	No.	91,200	0 40	36,480 00
Track-laying	per mile.	38	290 00	11,020 00
Ballasting	p cub. yd.	57,000	0 33	18,810 00
Points and crossings	sets.	8	10 00	80 00
Extra haul, say				18,500 00
Wages (with 15 per cent. added), say				2,500 00
				2,437,474 55
Works on Contract 14 chargeable to Contract 15.				
Materials delivered :—				
Ties	No.	192,000	0 40	76,800 00
Track-laying	per mile.	80	290 00	23,200 00
Ballasting	p. cub. yd.	160,000	0 33	52,800 00
Points and crossings	sets.	20	10 00	200 00
Total				2,634,674 55

Amount of work on Contract 14 chargeable to Contract 15, $153,000.00.

JAMES H ROWAN,
District Engineer.

I should like to make an explanation with regard to this matter. You will find that this estimate is somewhat in excess of the estimate submitted last year. The apparent increase between the amount given yesterday of $2,525,000 as the probable cost to complete with earth instead of trestle-work, and the statement which I now hand in, which shows the cost for the same thing, is $2,634,674 (an increase of about $119,000), is largely due to the increase in the quantity estimated of loose rock to complete, which in this estimate is set down at 95,756 yards; moneyed out at the contract rates, this would cost $167,593. This large increase which we are obliged to estimate is in consequence of the orders that Mr. Marcus Smith gave the Division Engineer when going over the work with him in reference to the manner in which we were to estimate the material taken out of the rock cuttings outside the slopes, as laid down by the specification. I was not over the work with Mr. Smith myself, for reasons which I have already explained, but the Assistant Engineer, Mr. Carre, came through with him, and the Contractor's Engineer and the Contractor. They represented to Mr. Smith the hardship the Contractor was laboring under, because we would not return the rock that was taken out outside of the prescribed form of the cuttings. They said they were obliged to take it out owing to the nature of the rock and explosives used, and they could not stick closely to the specification. They had to remove the rock, and they asked to have it allowed in the estimate. The Assistant Engineer told me afterwards in Winnipeg that Mr. Smith had given verbal orders that the contractor was entitled to an estimate for this rock, as he could not stick closely to the exact form of the slope; that as the Contractor had to take the rock out he should be allowed for it. When the engineer called my attention to this, I spoke to Mr. Smith on the subject, in Winnipeg, and I said: "If you decide it in this way, it is going to be a serious thing for the work; our estimates will be all astray, because we supposed that we were tied down by the specification, and our fight with the contractor has been, that he is not entitled to any rock taken from outside the prism, except what we deemed to be injurious or in such a position that it was likely to fall in on the trains when they were passing, and had to be taken out." Mr. Smith said the contractor could not do the work in that way; that it was not fair to him; that it was impossible that he could take out the rock according to specification. We had a consultation on the subject, and after discussing the matter I turned up the specification, and showed Mr. Smith how it was written and printed, and how very stringent and plain the directions were to my view. He then modified it by saying "put it in as loose rock." I said, "If we have to give the contractor an extra amount, let us not make it more than loose rock price, and he will be well paid for what he does." I am quite free to admit that it is almost impossible for the contractor, except at very great loss indeed, to take out the rock in this form, but if we go beyond our orders, and allow that work even as loose rock, it is going to increase the rock quantities very much." It is due to that substitution that we are obliged to estimate for a very large increase in the quantity of loose rock. We are obliged to increase the proportion of loose rock very largely. Of course it is a question still to what extent this increase will be approved, because it is not all taken out, and as the contractor goes on the quantity will increase. It is my impression that it will increase the amount by, say $125,000, or thereabouts, over what we had previously supposed would be the quantity required to complete the contract.

By the Honorable Mr. McLelan:—

Q. What becomes of that rock?—It is put in the embankments.

Q. Then it has not gone to waste?—No, certainly not. If it had been going to waste Mr. Smith would not have allowed the contractor a yard for it. That was one of Mr. Smith's arguments: "You are putting it into the bank and you must pay the contractor for it." I think he used the old familiar adage, "You cannot have your loaf, and eat your loaf at the same time."

By the Honorable Mr. Penny:—

Q. But this work was one of the items on which the price was very high?—Certainly.

Q. So that he might be supposed to do a certain amount of extra hard work, and yet be tolerably well paid for it?—Yes, but we cannot get contractors to do any extra work without paying for it.

Q. His price being high for that kind of work, he might not be supposed to lose altogether on the rock taken out, beyond the prism?—No, but it has been returned up to the present as loose rock.

By the Honorable Mr. McLelan:—

Q. Supposing he did not put it into the embankments. Supposing he cut it down as you have drawn it theoretically, would you not require more material to make up your embankments eventually?—Certainly.

Q. And that material would have to be borrowed?—Yes, but we would not borrow rock for it. We would put in earth to make up the deficiency. Of course he has taken this rock out, and it has gone into the banks. To that extent it is useful; but if we had to do it of our own choice, of course we would not put in rock at that high price; we would ask him to put in earth at the contract price, 37 cents, instead of rock at $1.75.

Q. In this case do you measure as solid rock or as loose rock?—We measure it as solid rock, and return it as loose rock. Two yards of solid rock, when broken up and dumped into a bank, will make up three yards of embankment, so that if the cutting had only 200 yards of solid rock, and the bank 300 yards, by the time you had taken out all the solid rock the bank would be made up.

Q. You could not make it up with 300 yards of earth?—No; it would take 300 yards, and the ninth of 300 yards to make that bank up with earth, that is one-ninth more than the original quantity in the cutting.

By the Honorable Mr. Macpherson:—

Q. Is it in the cuttings you measured it?—Yes.

By the Honorable Mr Haythorne:—

Q. Do these rock embankments ultimately settle down?—No; not on dry land, but they do settle some in the water.

Q. Do they not settle on the land when traffic goes over them?—It is imperceptible; the mere dumping over the bank settles them.

Q. Could not that change have been anticipated in drawing up the specification, and a provision made that it would be considered a just thing to give the contractor this allowance?—I do not think it was anticipated.

By the Honorable Mr. Penny:—

Q. You do not consider it a just claim?—Mr. Fleming has conferred with me with reference to several of these items, and I know as far as the specification goes, it embodies Mr. Fleming's views of it. It is binding on us unless his representative comes along and tells us to interpret it in a certain way, and I take it as Mr. Fleming's authority for interpreting it in that way. We never discussed the point of estimating this extra rock until Mr. Smith came along. We would not return the rock, and the fact is, the contractor was very far behind with his estimates. A month after Mr. Smith made the order, we were obliged to put it in as loose rock, and it swelled the estimate, not only by that month's work, but by what was held back besides. Mr. Fleming's view of the subject, as I understand it, is, that if the cutting has to be taken out beyond the slope, as required by the specification, and the rock is of a shaley character that will not stand, and it has to be taken out beyond the specified form, all he could possibly expect was to be paid for it at earth prices, because if we had to borrow to make up the embankment, it is earth we would have to borrow, and he would only be allowed for the material he takes out to please himself, the price of the kind of material that we would put into the bank. That accounts for the increase of the quantity over our estimate of last year. Of course in all other items there may be modifications, but the general result would have been pretty much what I made it to be last year, but for the change due to this extra quantity as loose rock.

By the Hon. Mr. Macpherson :—

Q. I think the Committee understood you yesterday to say that there had been no dry fills where trestle-work had been originally specified? Do you adhere to that, or is that your meaning?—No; it is what I said and it is what I mean in my view of the case, which I will explain to the Committee. It conveys an idea that I did not wish to convey and I will repeat it in a different form. There are banks made where trestle-work would have gone, and if those are the banks to which Mr. Smith refers, then his statement may be accounted for in that way, for this reason: I thought when I was giving my answer to the question, the Committee understood when I said there was nothing done, but what I had been authorized to do by Mr. Smith, with reference to the water-stretches, that we had put rock sides instead of solid rock base in the water-stretches, and that it took less rock to cross the water stretches in that way. Consequently as there was rock enough in the cutting on the whole section to make up the water-stretches—only it would have to be carried a long distance—when you put it into the water-stretches only for side walls, it left a mass of rock on our hands from the cuttings which was available to make up the land voids. Therefore, when I was giving evidence, I said we had not done anything beyond what was authorized, because the rock that was saved out of the cuttings was in my view a part of the other. Therefore, I may have conveyed to the Committee, the impression that there was really no place on the land-stretches where embankments are now, that would not have been made if the work had been done under the original contract. The Committee will now see there must be bank where it was originally intended to be trestle-work as we did not waste the stuff taken out of the cuttings. When Mr. Smith came along he made certain suggestions and changes that I did not feel warranted in making, without the approval of my superior officer, and they have very materially improved the work as well as reducing the cost very decidedly. Whether the present cost is reduced there is no doubt that the improvements Mr. Smith has ordered on his own views, and on my suggestions, will have the effect of materially reducing the ultimate cost of the work.

Q. Can you give us an approximate idea of the proportion of trestle-work that was specified for the land voids which has been dispensed with, by making solid embankments of earth and rock?—I cannot tell you right off; but the statement I am bringing down will give you the money difference.

Q. The Committee understood you to say yesterday that more than half the trestle-work had been dispensed with, by adopting the solid embankments across the water-stretches?—Yes, more than half.

Q. What further proportion of the other half has been rendered unnecessary by filling of these land voids with solid embankments?—I really cannot say, but probably it is one-fourth or one-third, because it is the low-priced trestle-work that is thrown out by our filling up. Earth filling up to 18 feet is cheaper than trestle-work at Mr. Whitehead's price.

Q. What I would like to get approximately is this: Suppose the Government determined to finish the section by using trestle-work, what proportion of the original trestle-work would be required?—That is what the statement I am now preparing will show you.

Q. More than one-half has been dispensed with on the water-stretches?—Considerably more than one-half.

Q. Do you consider altogether if that order were given now that more than one-half of the original trestle-work would be constructed?—I think I could put it in this way if it would satisfy the Committee, although it is merely guess work. I do not think if we were to order the trestle to go on now, that there would be much more than one-fourth or one-third of the original trestle-work to be done. It is a haphazard guess however.

By the Honorable Mr. Penny :—

Q. But the abolition of the trestle-work in favor of the bank in the water-stretches has been economy?—Yes.

Q. Economy in construction?—Yes.

Q. And that was authorized by Mr. Smith?—Yes. It is clearly demonstrated that it is direct economy in construction.

By the Honorable Mr. Macpherson:—

Q. Then the Committee understand you to say that if the Government determined on going on now under the original plan, not more than one-fourth or one-third of the trestle-work originally specified would be constructed?—I think it would be something like that.

Q. The rest of the work having being filled in with solid banks?—Yes.

By the Honorable Mr. Penny:—

Q. But the reduction in that portion of the trestle-work which is upon the land is in consequence of the reduction of the trestle-work upon the water?—The reduction of the trestle on the land is due to the economy produced in substituting embankments for trestle-work on the water-stretches.

By the Honorable Mr. Macpherson:—

Q. Is it not partially due to increase of rock-work beyond what was originally estimated?—It may be, because if there is more rock-work, and two cubic yards of rock make three cubic yards of bank, the more rock you have, the more trestle-work it will do away with out of proportion to the rock cutting there is.

Q. What do you now estimate the quantity of solid rock-work at?—It is less than we estimated it in my statement of last year. The original estimate of solid rock was 300,000 yards; last year we made it in round numbers 525,000 yards; and now we estimate it will only be 516,000 yards. That is an increase of 216,000 yards over the original estimate.

Q. Did not that increased quantity of rock go to form embankments?—Certainly.

Q. And to that extent it diminishes the trestle-work?—Certainly; I think so.

By the Honorable Mr. Haythorne:—

Q. And the increase in the quantity of rock arose partially from lowering the grade?—It is due partially to lowering the grade and partially to incomplete information when we made the first estimate and the plans. What is left after accounting for the discrepancy between the two amounts, is due to a modification of the grades. I think I was asked yesterday,—"Did you furnish the contractors with bills of timber for the trestle-work?" and I said "No." I was then asked: "Did they ever ask you for them?" and I said "No." I wish to qualify that in this way: they never have asked me for bills of timber, but I find out upon inquiry that they have asked my Assistant Engineer, Mr. Carre, for bills of timber for the trestle-work, and, I think, at an early stage of the proceedings. We were not willing to give them because we could not tell what trestle-work would be required until the rock banks were done; and we might be committed to giving them bills for timber for trestle-work that we would never require. We have another and stronger ground which is: I do not think we are bound to give them bills at all. We furnish them with the drawings and plans, but we are not obliged to furnish them with bills, as they must arrive at the quantities themselves; and if we do it for them it is only an act of courtesy. I wish to correct what I said that I had never been asked for bills; they asked my assistant, Mr. Carre, in writing, but he did not give them any for the reasons I have stated. Since I was before the Committee yesterday I was looking amongst my papers for information for the Committee of the other House and I came across another letter referring to the substitution of earth and rock for trestle-work over the water-stretches, which I now beg to lay before the Committee.

(Copy.)

WINNIPEG, 18th September, 1878.

SIR,—You are aware that the Engineer-in-Chief recommended that the water-stretches on Contract 15 should be filled in with a base of rock taken from the cuttings, to be carried up to a level of three feet over high water mark, and of sufficient width to carry on earth embankment between that level and grade; the latter to be

put in at some subsequent period, the voids, in the mean time, being traversed by trestle-work of timber.

At the time this was recommended and the work let, the cross-sections had not been taken, and it was supposed that very little earth could be obtained on the contract.

At a subsequent date, when the cross-sections were completed and further examination under more favorable circumstances had demonstrated that a considerable quantity of earth could be obtained, it became evident that to complete the banks in the manner proposed would retard the work, as the cuttings having been reduced (while the banks were increased), in order to lessen expense, the rock required to make up the banks in the manner proposed would have to be hauled from considerable distance, which would increase the cost by the item "extra haul."

I, therefore, when you were here last October, submitted a plan to you, whereby the work could be expedited, the cost of these banks reduced, and the rock taken from the cuttings used to greater advantage. This plan you were pleased to approve, and I immediately wrote, 3rd November, 1877, to the Division Engineer, instructing him to that effect. Shortly afterwards the contractor submitted a proposition in writing, offering to make up all the banks on the contract for which there was not sufficient rock, with earth, at his contract rate, 37 cents, and without charge for "extra haul," he to find the material where he could, thus doing away with all trestle work.

This proposition I submitted to you, with a report, on the 5th March last, recommending its adoption. I also, on the 25th January last, called your attention to a saving which could be effected by the substitution of permanent structures at certain points.

Not having received any acknowledgment of these communications, I made a further report, 22nd May, 1878, on the subject, to the Engineer-in-Chief, after his arrival from England. The work is progressing rapidly. It is important that some decision should be arrived at in reference to these questions, and that I should be instructed accordingly. You have now passed over the whole contract. I desire, therefore, to bring this matter again under your notice while here, so that I, as well as the Division Engineer, who is at present in town for that purpose, can furnish you with any additional information on the subject which you may require.

I am, sir, your obedient servant,

(Signed) JAMES H. ROWAN.

MARCUS SMITH, Esq.,
Acting-Engineer-in-Chief.

HENRY CARRE, re-called, was examined as follows:—

By the Honorable Mr. Macpherson:—

Q. The Committee understood you to say, I think, that before you completed your survey of the southern line from Rat Portage to Selkirk, that work had been done on the line finally adopted?—Yes; there had been.

Q. Was it placed under contract?—Yes; Mr. Sifton was carrying out his contract at the time.

Q. And he was working upon it?—Yes.

Q. Did you say that the southern line was 31 miles longer than the northern or located line?—Yes.

Q. How do you account for the difference in distance?—From the departure from the straight line. The first line was the most direct we could get, and the other line was run to try and avoid the heavy works, and go further south to connect with the water-stretches, and then return to Selkirk, that being the objective point to arrive at, then the southern line was the longer.

Q. Did you continue the southern line to Red River at all?—No; we connected with the other line near Broken Head River, and then followed it to Selkirk.

H. CARRE.

ADDENDA No. 1.

OTTAWA, 2nd May, 1879.

Since my examination before this honorable Committee, I have read the evidence of Mr. Fleming, Chief Engineer of the Canadian Pacific Railway, and of Mr. Marcus Smith, acting Chief Engineer in Mr. Fleming's absence.

The contracts under consideration were let as schedule contracts, that is to say, at prices per cubic yard, or according to known standards of measurement, the quantities of each kind of work having to be determined by actual measurement. The prices for Contract 15, applied and extended according to the quantities in the bill of works for the above section, amounted to about $1,594,000.

On the 11th March, 1870, Mr. Marcus Smith forwarded for payment Certificate No. 275, above his signature, stating that on Section 15, Canadian Pacific Railway, the contractor had executed work and delivered materials "under his contract without extras" to the value of $1,279,972.

The quantities set forth in the bill of works by which the selection of the tenders was determined were stated to be approximate.

It is desirable that such quantities should be as accurate as possible. The most important consideration is that the Government should know exactly the cost of any proposed work. If the quantities are correct, or nearly so, there is likewise more certainty that the lowest tender will be known.

But, apart from these two considerations, there are equal objections to an exaggerated as to an insufficient estimate of a proposed work. If a close adherence to the quantities used in the comparison of tenders were made the criterion whether or no the works had been successfully carried out, the engineer making an insufficient estimate will naturally endeavor to keep the expenditure within the limit.

On the other hand, the engineer who makes an over-liberal estimate, will feel no restraint, and will be inclined to perform work in excess of positive requirement. Moreover, there is the temptation to execute work of a higher character than is called for.

The great cost of the railway through the rock belt of 80 miles, of which Section 15 is a portion, has often formed the subject of consideration by the Department.

During the past year it has been verbally stated by the engineers of the Department that on Sections 14 and 15 the quantities given in the bills of works would be considerably exceeded by the quantities of the work when executed. This excess, however, will in no way be owing to extra work. With the exception of a tunnel on Section 25, the Department has given no orders for extra works on either of the four Sections, 13, 14, 15 and 25.

In May, 1878, Mr. Fleming forwarded a communication of Mr. Rowan, the District Engineer, stating that if an additional expenditure of $260,000 were authorized, solid earth embankments could be substituted for trestle-work on Section 15. This expenditure was recommended by the Engineer-in-Chief, and it was submitted by the Minister to Council, but as it was not approved of, no orders were issued by the Department to make the change.

It is stated in the evidence before the Committee, that the substitution of earth embankments for trestle-work was ordered by Mr. Fleming, the Engineer-in-Chief. A letter was written to Mr. Fleming on the subject. In answer, Mr. Fleming reports that he has not ordered the substitution of earth embankments for trestle-work or any extra work whatever on Section 15.

I produce Mr. Fleming's letter.

T. TRUDEAU,
Deputy Minister of Public Works.

(Copy, No. 11,436—subj. 961.)

OTTAWA, 26th April, 1879.

SIR,—The Department has noticed, in the evidence recently given before a Committee of the Senate on Canadian Pacific Railway matters, by Mr. Marcus Smith, a member of your staff, that important changes are said to have been made, on your authority, in the nature of the works on Section 15, Canada Pacific Railway, which will increase very largely the original estimated cost of that Section.

Will you be good enough to report the nature of such changes, if any have been made, together with the cause which necessitated them and on whose authority they were made?

I have the honor to be, Sir,
Your obedient servant,
(Signed) F. BRAUN,
Secretary

SANDFORD FLEMING, Esq.,
Chief Engineer, Canadian Pacific Railway,
Ottawa.

CANADIAN PACIFIC RAILWAY,
OFFICE OF THE ENGINEER-IN-CHIEF,
OTTAWA, 29th April, 1879.

To the Honorable
The Minister of Public Works.

SIR,—I have received from the Secretary a letter informing me that in the evidence recently given before a Committee of the Senate, a member of my staff, Mr. Marcus Smith, had said that important changes in the nature of the works on Section 15, which will very largely increase the cost of the section, have been made on my authority.

I am called upon to report the nature of such changes, if any, which have been made, and the causes which necessitated them.

I beg to state that repeated attempts had been made to place this section under contract between February, 1875, and December, 1876; and it was not until January, 1877, that a contract was entered into with Sutton, Thompson & Whitehead for doing the work. The first certificate was issued on March 17th, 1877, for $8,316. The work went on until May, 1878, when the certificates amounted to $486,631.

On the 22nd of that month I made the following report to the Department:—

CANADIAN PACIFIC RAILWAY,
OFFICE OF THE ENGINEER-IN-CHIEF,
OTTAWA, 22nd May, 1878.

SIR,—Mr. Whitehead, on the 6th November last, proposed by letter, addressed to Mr. Rowan, which letter is herewith enclosed, to complete the roadway on Section 15 with permanent rock and earth embankments throughout, in lieu of the wooden trestle-work, which was originally proposed to be built in many places. He proposes to find all the material required for making the solid embankments at the contract price for earthwork (37 cents), and make no charge for extra haul for any that may have to be brought from long distances.

The District Engineer reports, this date, that the contract cost of trestle-work, which would be dispensed with by the course proposed, would be about $360,000; that an additional present expenditure of $260,000 on earthwork under Mr. Whitehead's offer, including masonry-culverts, would make all the embankments permanently

solid. As trestle-work is always more or less dangerous, especially liable to be consumed by fire during the dry season, in a country such as the one the line goes through, and would have to be constantly renewed until ultimately filled in solid, I am of opinion that it would be sound economy to accept Mr. Whitehead's offer, and, therefore, recommend it.

I am, &c.,

(Signed) SANDFORD FLEMING,
Engineer-in-Chief.

F. BRAUN, Esq.,
Secretary, Department Public Works.

OTTAWA, 22nd May, 1878.

DEAR SIR,—Having received from the Division Engineer of Contract 15 the estimate referred to in my letter of the 5th of March last, reporting on the subject of Mr. Whitehead's proposal: "To make the embankments on Contract 15 with earth instead of trestle-work," contained in his letter of the 5th November, 1877, which was enclosed in the above-named letter of mine, I now submit further information on the subject as follows:—

The cost of completing the banks with earth instead of trestle-work will be	$550,500 00
Deduct trestle-work done away with in consequence.	362,000 00
Balance	188,500 00
Add for masonry and permanent structures, say	70,000 00
	258,500 00
If trestle-work of the value given above ($362,000) is put in now, its cost at 5 per cent. per annum, compound interest, at end of six years, say	$485,000 00
By which time it would have to be either partially or wholly renewed, or replaced by earth filling. If the latter, and if this could be put in at 28 cents per cubic yard, instead of at present contract rate of 37 cents per cubic yard, there must then be a further expenditure of	401,500 00
To which must be added, as above, masonry permanent structures	70,000 00
Cost at end of six years	956,500 00

The immediate increased cost of change ($620,344) would, if treated in the same manner, amount to the sum of $831,318.00, leaving a balance in favor of the proposed change of $125,182.00. Or, putting it in another form, as follows: the result would be estimated cost of completing now the banks with earth instead of trestle-work:—

Earth, 1,433,281 cubic yards, at 37 cents	$530,313 97
Timber in culverts, &c	20,030 75
Permanent structures	70,000 00
	620,344 72
Trestle-work done away	361,856 61
	258,488 11

Suppose trestle-work put in now at a cost of.....	$361,856 61
And that it would last 10 years before being replaced by earth, 1,433,281 cubic yards, at 28 cents.....	401,318 68
To which add timber in culverts	20,030 75
do permanent structures	70,000 00
	853,206 04
Add 10 years' simple interest at 5 per cent. on $361,856.61, trestle-work	180,928 30
	1,034,134 34
If, for purposes of comparison, 10 years' simple interest, at 5 per cent. per annum, be also added to present increased cost, on account of change.....	$620,344 72
Interest.....	310,172 08
	930,516 80

Shewing a balance, even this way, of $103,617.54. To this saving in money must also be added the important consideration that portions, or the whole of the trestle-work, may be destroyed by fires, which are of frequent occurrence in the woods through which the whole of this section of the railway passes.

Should such an event occur, the traffic of the line will be seriously interrupted. Indeed, it is not at all improbable some portions of the trestle-work will be destroyed by fire before the line is opened.

These dangers will be entirely removed by the adoption of the course now recommended.

Yours truly,

(Signed) JAMES H. ROWAN.

SANDFORD FLEMING, Esq.,
Engineer-in-Chief.

WINNIPEG, November 6th, 1877.

SIR,—I beg leave to make the following remarks and proposition in reference to the work on Contract 15, with a request that you will submit the same to the Government.

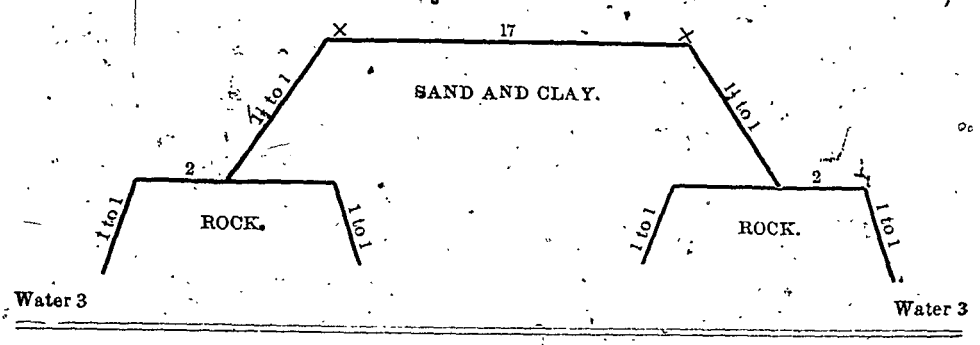
The quantity of rock required to be placed in the base of embankments through lakes, in order to make them wide enough to carry earth embankment subsequently, has to be carried such a distance over intervening spaces as to greatly retard the progress of the work.

The disproportion between the quantity of material in the cuttings and that required to complete the embankments, will necessitate so very large an amount of trestle-work to bridge over the intervening space that I cannot procure a sufficient quantity of suitable timber in the country with which to construct it. I have ascertained by recent investigation and the sinking of test pits that sufficient, or nearly sufficient, material, sand and clay, can be obtained from borrowing pits to complete the whole of the banks; but some of this material would have to be hauled for a very considerable distance.

As, however, the adoption of this course would greatly facilitate my progress with the work, I would beg leave to make the following proposal, which I believe will be found more economical for the Government also in the long run:

If the Government will consent to do away with the trestle-work altogether, and permit me to complete the banks with clay and sand, I will agree to find the necessary material at my present price per cubic yard for earth work and make no charge for extra haul for any of the material required to do this, which has to be procured from borrowing pits.

And I will make up the embankments through water with two rock banks carried up to three feet above high water mark, and having a berm of 2 feet outside the foot of the earth slope, on the plan suggested by you, as in the accompanying sketch, without extra charge.



An early reply will greatly oblige, as it is necessary for me to make special arrangements for the transport of material if my proposal is approved of.

I remain,

Your obedient servant,

(Signed) JOSEPH WHITEHEAD.

JAS. H. ROWAN, Esq.

The day following the date of that report, viz., on the 23rd May, I left on leave of absence for England, and did not return until the end of October I left Mr. Marcus Smith to act in my place during my absence, and on my return, being engaged with other matters, I allowed him to continue to attend to that section, and he has practically done so ever since, and he has certified for all the work that has been done since my return. The following certificates have been issued by Mr. Smith:—

November 21st, 1878	$ 980,757 77
December 12th, 1878	1,070,845 03
January 14th, 1879	1,139,802 81
February 13th, 1879	1,217,462 84
March 11th, 1879	1,279,972 86

The printed form of the certificate requires that the party signing it should give the authority on which the work has been executed, and Mr. Smith has in all these documents certified that the work has been executed by order of the Department of Public Works, and not by any order of mine.

As a matter of fact, I have personally given no orders or instructions to make any change in the character of the work, which would largely increase, or in any way increase, the cost of the section. I have no power, and no one under me has any power, to give any such orders without the knowledge and authority of the Department.

It is perfectly true I recommended, on the 22nd May last year, that a certain change should be made, and that I expected when I left for England that the change

would be authorized by the Department. Looking at the face of the certificates above cited, the only inference to be drawn is that Mr. Marcus Smith had received an order from the Department to make the change, or had satisfied himself that such an order existed.

Since my return to Canada, in October last, I have made only one report and recommendation respecting Section No. 15. The contractors applied for an advance of $100,000 (on plant) to enable them to carry on the work. On that occasion Mr. Smith gave it as his opinion "that the Government would not only be perfectly safe in advancing the sum asked, but it would be expedient and good policy to do so."

A copy of my report on that occasion is attached. On reference to it, it will be seen that I did recommend an advance, but not to the extent strongly advised by Mr. Smith. Instead of $100,000, my recommendation was limited to $40,000.

So far from ordering work to be done without authority, I have been extremely careful not to do so, and I have as far as practicable insisted that no work whatever should be undertaken that was not duly authorized.

Mr. Smith has had full charge of these works. I have looked to him to see that everything was properly done and that nothing was done without authority. He has certified that nothing has been done except by order of the Department of Public Works; and accordingly I conclude that there must be some mistake in the evidence referred to in the letter of the Secretary.

I have the honor to be, Sir,

Your obedient servant,

(Signed) SANDFORD FLEMING,

Engineer-in-Chief.

Form No. 3.

Certificate No. 276.
No. of Estimate on this Contract, 25.

PUBLIC WORKS OF CANADA.

CANADIAN PACIFIC RAILWAY.—SELKIRK TO KEEWATIN.

Name of works, grading, bridging and track-laying. Number of Contract, 15th. Name of Contractor, Joseph Whitehead, formerly Sutton, Thompson & Whitehead. Date of Contract, 9th January, 1877.

Progress estimate for work done and materials delivered, from the beginning of the month to the 28th February, 1879.

The works, of which this is an estimate, are being executed by order of the Department of Public Works, contained in letter No. 7321, dated 10th January, 1877, addressed to Sandford Fleming, Esq., Engineer-in-Chief.

Total value of work done and materials delivered, under the above-named authority, and without extras, up to the 28th February, 1879	$1,279,972 86	
Less 10 per cent, drawback retained	127,997 29	
Total		$1,151,975 57

I certify that the above is a correct statement, made up from the detailed estimates fyled in this office.

(Signed) MARCUS SMITH,

Acting Engineer-in-Chief.

Office of the Engineer-in-Chief,
Ottawa, 11th March, 1879.

(Letter No. 7321—subj. 961.)

OTTAWA, 10th January, 1877.

SIR,—*Re* 15th Contract—I beg to transmit to you two copies of the contract just entered into with Messrs. Sutton, Thompson & Whitehead, for the grading, &c., from Cross Lake to Rat Portage; and track-laying, &c., from Selkirk to Rat Portage, Canadian Pacific Railway—one for yourself and the other for the Engineer in charge.

I have the honor to be, Sir,

Your obedient servant,

(Signed) F. BRAUN,

Secretary.

SANDFORD FLEMING, Esq.,
Engineer in Charge,
Canadian Pacific Railway.

ADDENDA No. 2.

(*Memorandum.*)

Since my examination before the Honorable Committee I have read the letter of the Engineer-in-Chief, Mr. Fleming, to the Honorable the Minister of Public Works, dated April 29th, 1879.

In reference to the monthly certificates, I have to state that I signed those at the request of Mr. Fleming, and was no farther responsible for them than that they were made out strictly in accordance with the detailed estimates sent in to this office by the District-Engineer who is responsible for the quantities, and I had no reason to doubt that he was executing the works by order of the Department of Public Works under the instructions of the Engineer-in-Chief.

As regards any changes in the works, by substituting solid embankments for trestle-work, I have to repeat that Mr. Rowan stated to me that Mr. Fleming showed him his letter to the Department of Public Works, dated 22nd May, 1878, recommending these changes; and Mr. Fleming seems to have been so well assured that his recommendation would be approved, that he gave verbal instructions to Mr. Rowan to proceed in accordance therewith—at least this is what Mr. Rowan distinctly stated to me.

In my evidence I stated that on receiving a copy of Mr. Fleming's letter of the 22nd May—which I did, at Winnipeg, on the 19th of September—I made no application to the Department of Public Works to ascertain if the recommendation contained therein had been authorized, because I had no doubt that it had been so far approved as to justify Mr. Fleming to instruct Mr. Rowan to proceed with the works in accordance therewith. It will be seen, moreover, that it would have been useless my writing to the Department, because a categorical answer to the question respecting the changes would not have assisted me, for, on my inspection of the works, I had found that the plans of construction would have to be remodeled and a new proposition submitted to the Department of Public Works, which I shall now endeavor to explain briefly.

I went over the whole of the section in company with Mr. Carre, the resident engineer, and Mr. Ruttan, the contractor's engineer, and took notes of every work of importance. I was strongly impressed with the meagerness of the information obtained respecting the depth of soft mud and the dip of the rock in the bottoms of the numerous small lakes that had to be crossed. It appeared evident to me that in some of these it would be found that neither trestle-work or solid embankments would be suitable, and permanent bridging might have to be adopted; and that in other places trestle-work might be applicable in one case and solid embankment in another. In fact each of these difficult portions of the work required a special study, and proper works on any general theoretical system could not be designed on the insufficient data in possession of the engineers.

Therefore, after arriving in Winnipeg, I telegraphed to Ottawa for a set of boring tools, and gave instructions to the engineer in charge to get all the information possible.

At several points I believe that a deviation of the line would greatly reduce the quantity of excavation, and I gave instructions for surveys to be made to test this.

I then worked a fortnight in the office endeavoring to solve some of the difficulties, and allowed the formation of rock embankments at the foot of the slopes from rock taken out of the cuttings, according to the plan proposed by Mr. Rowan,

and which in a case that had been submitted to me in October, 1877, I had approved, because I found in that case it would be the most economical distribution of the rock taken from the cuttings, and it does not necessarily imply the *immediate* filling in with earth; trestle-work may be used at first, and when this decays earth embankments may be substituted; but in some cases I found trestle-work would be almost impracticable, or at least not economical in deep water where a rock base would have to be formed or piling that would have to be braced under water.

There was, in fact, very little earth embankments done at this time or could be done for many months.

Before leaving Winnipeg I gave Mr. Rowan instructions to have all the surveys made which I had suggested, and to obtain all necessary information with the least possible delay, and to send me monthly reports of all that was being done on the works; also to have as close an estimate as possible made of the cost of completing the works, this is to be in Ottawa not later than the end of January.

I regret to say that, notwithstanding letters and telegrams both from Mr. Fleming and myself, I have not to this day received one report, or the estimate asked for.

This so embarrassed me that on the 17th February I wrote to Mr. Fleming asking him to relieve me from further responsibility, and take the matter into his own hands. He has since informed me that he intends to send out an engineer specially to investigate and report on the works of this section.

I had, however, a letter from Mr. Carre, the resident engineer, dated 30th November, 1878, in which he states that the deviations of the line which I suggested had proved very satisfactory; and within the last twenty-four hours he has shewn me the plans, profiles and comparative quantities of the two lines, which shew a saving of not less than $130,000 by the deviations, if solid embankments are made. The saving would be less in comparison if trestle-work were adopted, but this is scarcely practicable in some places.

On December 20th, I telegraphed Mr. Rowan that for the crossing of War Eagle Lake to make a rock embankment a little above water level, with a trestle superstructure, as I found this would be the most economical under all circumstances, and could be renewed with iron trestle or bridging.

At Lake Deception I allowed the work to go on as it had been ordered by Mr. Fleming, as I am informed, in 1877, that is an earth embankment, as there is plenty of earth close at hand. These are the only special instructions I have given since I left Winnipeg.

It is evident that suitable works for this section can only be designed by intelligent study of each difficulty, and not by any general theory, and that the data obtained on this as on the other sections before the letting of the contract, were so deplorably insufficient, that in whatever way the works are carried out the cost must greatly exceed the original estimate. The difficulty of properly remodelling the plans of these works in accordance with better information now obtained, is greatly aggravated by a tender having been accepted so inconsistent that in some of the items there will be a large profit, and in others a positive loss, so that in any alteration of the works which the engineer is empowered to make according to the "conditions of contract," the contractor may suffer a great loss or get so great an advantage that if worked out to the new quantities it may be found that the lowest tender has not been accepted.

MARCUS SMITH.

ADDENDA No. 3

ENGINEER'S OFFICE, CANADA PACIFIC RAILWAY,
OTTAWA, 6th May, 1879.

SIR, I beg permission to call the attention of the Honorable Committe to certain statements, made before the Committee, respecting the works on Contract No. 15 :—

1. In October, 1877, I inspected the works on some portions of the Canada Pacific Railway, and my attention, for the first time, was called to Contract No. 15. I endeavored to visit that section, but the steamer on the Lake of the Woods failed to meet me as had been agreed on. Only one hour before the steamboat started from Winnipeg, by which I was to proceed on my way to Ottawa, Mr. Rowan, the District Engineer, and Mr. Ruttan, the Contractor's Engineer, submitted a proposal for some alterations between Stations 230 and 290 (four to five miles from Rat Portage), about a mile and a quarter in length, that would greatly facilitate the Contractor's operations, at the same time making a more economical distribution of the rock taken from the cuttings than originally proposed. I agreed to this verbally, but warned Mr. Rowan not to make any other changes without application to me at Ottawa, accompanied by profiles, quantities and estimates, as I had no power to make any considerable changes without the approval of the Department of Public Works. So that Mr. Rowan had no authority from me to write the letter to Mr. Carre which he read before the Committee yesterday, nor to alter any other portion of the works but that which had been submitted to me and approved.

On my return to Ottawa, I told the Minister of Public Works what I had done and what instructions I had given to Mr. Rowan, which he approved.

No more correspondence took place respecting the works on this section till Mr. Rowan submitted a report to me on the 5th March, 1878. Parliament was then in Session, and I was so much engaged on more pressing business that I could not look at the report for some time. When I did glance at it, it appeared to be based on insufficient data and too theoretical to merit consideration, and it was laid aside. So little did I think of it, I told Mr. Rowan he must get more information before I could give it any attention.

Mr. Fleming arrived about this time from England, and it appears, in evidence, that an amended report was submitted to him and approved by him; and he recommended the Department of Public Works to have the character of the works changed in accordance therewith. But I knew nothing of this till I arrived in Winnipeg in September following.

On going over the section, I found that the rock taken from the cuttings was being disposed in two narrow embankments, where water had to be crossed, in the same manner as I had approved in the short section submitted to me in October previous, instead of the original manner proposed by Mr. Fleming. Mr. Rowan had no authority for this, but I could see no great objection to it as it would be, in most cases, the most economical way of disposing of the rock; and where trestle-work was intended to be erected, it had always been understood that, on its decay, earth embankments would be substituted; so that these narrow embankments would be a protection to the foot of the slopes against the action of the water whenever the embankments were made.

There were, however, portions of embankments made at several points, which I can point out on the profile, where trestle-work was originally intended, some of which had been done in 1877, before I had anything to do with the works, and others since the change was recommended by Mr. Fleming; so that I was perfectly correct

in stating that, on my visit, I found that the works were being carried out in accordance with Mr. Fleming's recommendation.

The small quantity of work done does not contradict that, as there had been little time to do much besides the rock cutting, only two months having elapsed from the time of Mr. Rowan's return to Winnipeg and that of my visit; but both Engineers and Contractors understood that the works were being carried out according to Mr. Fleming's recommendation. Every preparation was being made for this. The Contractor was getting in costly plant, including steam-shovels, for this work, and not, as Mr. Rowan stated, for ballast pits, but in addition to what were used in those pits; and no preparation was being made for trestle-work, although the Contractor's Engineer had repeatedly asked for bills of timber for the same, notwithstanding Mr. Rowan's statement to the contrary. The enclosed copies of letters will attest that fact.

On 6th February, I sent instructions to Mr. Rowan directing him how to make the borings at Cross Lake, by which the character of the structure would be determined. But I have just learned that, notwithstanding the object for which these borings are being made, the Contractor has been allowed to put up temporary trestle-work with the avowed object of making an earth embankment.

This is directly contrary to my instructions; and the object of withholding the monthly reports that I requested Mr. Rowan to send to me, now appears to have been to conceal from me what was going on; and I have no doubt that everything that has been done since my visit, has been done in accordance with the change in the works recommended by Mr. Fleming, but done without my knowledge.

I have the honor to be, Sir,

Your obedient servant,

MARCUS SMITH.

Hon. D. L. MACPHERSON,

Chairman, Committee on Pacific Railway.

ADDENDA No. 4.

CANADIAN PACIFIC RAILWAY.

Contract 15.—Approximate Estimates.

Comparative Estimate of Cost to complete Contract 15 with Trestle-work, according to Contract, as against cost of completion with Protection-banks and Earth-fills over water stretches, and Trestle-work over land openings.

Description of Work.	Approximate Estimate to complete with Trestle-Work, according to Contract.			Approximate Estimate to complete with Protection-Walls and Earth-Banks across water stretches and Trestle-Work over land openings.		
	Quantities.	Rates.	Amount.	Quantities.	Rates.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.
Clearing ..... Acres	200	30 00	6,000 00	200	30 00	6,000 00
Close cutting ..... "	7	50 00	350 00	7	50 00	350 00
Grubbing (including side ditches) ..... "	35	80 00	2,800 00	35	80 00	2,800 00
Solid rock excavation ..... c. yard	516,226	2 75	1,419,621 50	516,226	2 75	1,419,621 50
Loose rock excavation ..... "	95,756	1 75	167,573 00	95,756	1 75	167,573 00
Earth excavation (including borrowing) ..... "	224,138	0 37	82,931 06	998,582	0 37	369,475 34
Excavation in off take ditches beyond railway limits ..... "	9,100	0 45	4,095 00	9,100	0 45	4,095 00
Earth excavation under water "	1,000	1 11	1,110 00	1,000	1 11	1,110 00
Under-drains ..... 100 l. ft.	3,226	55 00	1,774 00	3,226	55 00	1,774 00
Tunnelling for railway (sectional area equal to 15 cubic yards to the lineal foot) ..... l. feet	515	30 00	15,430 00	515	30 00	15,430 00
Twelve-feet tunnels for streams (4 cubic yards per lineal foot) "	400	14 00	5,600 00	400	14 00	5,600 00
Eight-feet tunnels for streams (2 cubic yards per lineal foot) "	650	9 00	5,850 00	650	9 00	5,850 00
Six-feet tunnels for streams (1 cubic yard per lineal foot) .. "	800	7 00	5,600 00	800	7 00	5,600 00
Bridge masonry ..... c. yard	2,000	11 00	22,000 00	2,000	11 00	22,000 00
Crib-work in abutments and piers of bridges (including timber and stone filling), also crib wharfing ..... "	1,700	2 75	4,675 00	.....	.....	4,675 00
Rip-rap ..... "	2,500	2 00	5,000 00	.....	.....	5,000 00
Bridge superstructure—timber —40 feet span ..... Per span.	1	600 00	600 00	1	600 00	600 00
Carried forward	.....	.....	.....	.....	.....	.....

CONTRACT 15.—Comparative Estimate of Cost to complete Contract 15, &c.—*Con.*

Description of Work.	Approximate Estimate to complete with Trestle-work, according to Contract.			Approximate Estimate to complete with Protection-walls and Earth-banks across water-stretches, and Trestle-work over land-openings.		
	Quantities.	Rates	Amount.	Quantities.	Rates.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.
Brought forward.....	.....	.....	.....	.....	.....	.....
Square timber, 16 in. by 12 in..l. foot	500	0 33	165 00			
do 15 in. by 12 in. "	84,000	0 30	25,200 00			
do 15 in. by 9 in.. "	84,000	0 30	25,200 00			
do 12 in. by 12 in.. "	1,000	0 30	300 00			
do 12 in. by 9 in.. "	20,000	0 28	5,600 00			
do 12 in. by 6 in.. "	140,000	0 28	39,200 00			
do 9 in. by 9 in.. "	245,000	0 25	61,250 00			
do 9 in. by 8 in.. "	225,000	0 25	56,250 00			
do 6 in by 4 in.. "	84,000	0 20	16,800 00			
Round timber, of size to square, 12 in. by 12 in.. "	260,000	0 18	46,800 00			
do 12 in by 10 in. "	44,000	0 17	7,480 00	Bulk sum for trestle-work over land openings..		278,745 00
do 12 in. by 9 in.. "	16,000	0 17	2,560 00			
do 12 in. by 6 in.. "	81,000	0 12	9,720 00			
do 12 in. by 4 in.. "	14,000	0 10	1,400 00			
do 9 in. by 9 in.. "	74,000	0 12	8,880 00			
do 9 in. by 6 in.. "	198,000	0 10	19,800 00			
do 9 in. by 4 in.. "	15,000	0 08	1,200 00			
do 6 in. by 4 in.. "	29,000	0 06	1,740 00			
8-inch flatted timber..... "	1,000	0 12	120 00			
Hemlock or spruce plank .per M. b.m	645,000	12 00	7,740 00			
Pine plank ..... "	1,000	25 00	25 00			
Hardwood plank..... "	1,000	20 00	20 00			
Wrought iron, including bolts, spikes, straps, &c.....per lb.	325,000	0 13	42,250 00			
Cast iron..... "	1,000	0 10	1,000 00			
Total value of trestle-work under contract	.....	.....	380,700 00			
Ties..... No.	287,200	0 40	113,280 00	287,200	0 40	113,280 00
Track-laying.....per mile	118	290 00	34,220 00	118	290 00	34,220 00
Ballasting .....c.yard	217,000	0 33	71,610 00	217,000	0 30	71,610 00
Points and crossings.. ..... Sets.	28	10 00	280 00	28	10 00	280 00
Extra haul, distance feet....c. yard	.....	.....	18,000 00	.....	.....	18,500 00
Wages, with 15 per cent. added	.....	.....	2,500 00	.....	.....	2,500 00
Total	.....	.....	$2,372,099 56	.....	.....	$2,556,689 04

JAMES H. ROWAN,
District Engineer.

Ottawa, 7th May, 1878.

ADDENDA No. 5.

MEMORANDUM.—Canadian Pacific Railway—Fort William to Sunshine Creek.—Contract No. 13.

(Quantities per Schedule taken out for 45 miles, while the works executed only cover 32½ miles.)

Description of Work.	As per Schedule on which Contract was based.			As executed by Sifton & Ward.			As executed by Purcell & Ryan.			Total.		
	Quantities.	Rate.	Amount.	Quantities	Rate.	Amount.	Quantities.	Rate.	Amount.	Quantities.	Rate.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.		$ cts.	$ cts.		$ cts.	$ cts.
Clearing ..... Acres	700	20 00	14,000 00	56·03	20 00	1,120 60	.....	.....	.....	56·03	20 00	1,120 60
Close cutting ..... "	22	40 00	880 00	58·79	40 00	2,351 60	.....	.....	.....	58·79	40 00	2,351 60
Grubbing, including side ditches.... "	114	60 00	6,840 00	87·95	60 00	5,277 00	.....	.....	.....	87·95	60 00	5,277 00
Fencing ..... per 100 L. feet	20,000	5 62	1,124 00	876·74	5 62	4,927 28	1,700	5 62	95 54	893 74	5 62	5,022 82
Solid rock excavation..... C. yds	30,000	1 25	37,500 00	24,294	1 25	30,367 50	.....	.....	.....	24,294	1 25	30,367 50
Loose do ..... "	8,000	0 50	4,000 00	40,141	0 50	20,070 50	1,439	0 50	719 50	41,580	0 50	20,790 00
Earth excavation, including borrowing..... "	944,000	0 23	217,120 00	585,231	0 23	134,603 13	13,962	0 23	3,211 26	599,193	0 23	137,814 39
Earth exacavation, additional, between stations 235 and 260. ..... "	.....	.....	.....	103,740	0 05	5,187 00	.....	.....	.....	103,740	0 05	5,187 00
Under drains..... per 100 L. feet	74,000	50 00	37,000 00	14,769	50 00	7,384 50	131·48	50 00	6,574 00	27,917	0 50	13,958 50
Bridges, Howe Truss, 100 ft. clear.... Span	2	3,000 00	6,000 00	3	3,000 00	9,000 00	.....	.....	.....	3	3,000 00	9,000 00
do 80 ft. clear... "	6	2,400 00	14,400 00	2	2,400 00	4,800 00	.....	.....	.....	2	2,400 00	4,800 00
do 60 ft. do ... "	1	1,800 00	1,800 00	1	1,800 00	1,800 00	.....	.....	.....	1	1,800 00	1,800 00
do 40 ft. do ... "	4	1,000 00	4,000 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cribwork in abutments and piers, with timber and stone-filling..... C. yds	6,800	2 25	15,300 00	3,677	2 25	8,273 25	.....	.....	.....	3,677	2 25	8,273 25
Rip-rap ..... "	1,200	4 00	4,800 00	5,476	4 00	21,904 00	996	4 00	3,894 00	6,472	4 00	25,888 00
Piles driven ..... L. feet	1,300	0 40	520 00	22,081	0 40	8,832 40	172	0 40	68 80	22,253	0 40	8,901 20
Timber 16 × 12 ..... "	10,000	0 35	3,500 00	7,614	0 35	2,664 90	.....	.....	.....	7,614	0 35	2,664 90
do 12 × 12..... "	100,000	0 30	30,000 00	57,011	0 30	17,103 30	429	0 30	128 70	57,440	0 30	17,232 00
do 12 × 6..... "	.....	.....	.....	1,346	0 15	201 90	.....	.....	.....	1,346	0 15	201 90
do 9 × 9..... "	.....	.....	.....	41,648	0 15	6,247 20	.....	.....	.....	41,648	0 15	6,247 20
do 9 × 8..... "	.....	.....	.....	9,700	0 15	1,305 00	816	0 15	122 40	9,516	0 15	1,427 40
do 9 × 6..... "	.....	.....	.....	.....	.....	.....	687	0 15	103 05	687	0 15	103 05
Flatted timber 8 inches..... "	30,000	0 15	4,500 00	7,015	0 15	1,052 25	.....	.....	.....	7,015	0 15	1,052 25
Hemlock or spruce planks per 1,000. B. M.	20,000	20 00	400 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pine planks per 1,000..... "	10,000	20 00	200 00	37,502	20 00	750 04	315	20 00	6 30	37,817	20 00	756 34
Hardwood planks per 1,000..... "	5,000	20 00	100 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sheet piling ..... L. feet	.....	.....	.....	49,014	30 00	1,470 42	.....	.....	.....	49,014	30 00	1,470 42
Wrought iron ..... Lbs.	20,000	0 10	2,000 00	54,462	0 10	5,446 20	672	0 10	67 20	55,134	0 10	5,513 40
Cast iron ..... "	3,000	0 07	210 00	21,896	0 07	1,532 72	.....	.....	.....	21,896	0 07	1,532 72

Building, supply road						359 00						358 00
Additional cartage on supplies						2,258 00						2,258 00
Expenditure caused by change of line, Fort William westward						3,142 00						3,142 00
Extra haul	C. yds					601 31						601 31
Powder	Kegs			50	4 00	200 00			50	4 00		200 00
Timber at Town plot, 16×12	L. feet			26	0 28	7 28			26	0 23		7 28
do do 12×12	"			1,775	0 21	372 75			1,775	0 21		372 75
Pine plank	B. M.			29,936	14 00	419 10			29,936	14 00		419 10
Timber and wages in erecting gallows frames, Howe Truss bridges						983 10						983 10
Altering and finishing other bridges and culverts						1,186 64						1,186 64
Days' work, as per bill No. 1, to October, 1877								1,957 13				1,957 13
do No. 2, to Nov., 1877								350 53				350 53
do No. 3, to May, 1878								54 76				54 76
do No. 4, to July, 1878								1,335 47				1,335 47
Totals			406,194 00			313,200 87		18,778 64				331,979 51

NOTE.—Purcell & Ryan having taken contracts for the track-laying and ballasting over this section were obliged to perform certain of these works, which were done at the same rates as Sifton & Ward.

ADDENDA No. 6

MEMORANDUM.—Canadian Pacific Railway—Sunshine Creek to English River—Contract No. 25, 19th March, 1879.

Description of Work.	As per Schedule on which Contract was based.			As executed up to 30th November, 1878.		
	Quantities	Rate.	Amount.	Quantities	Rate.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.
Clearing..... Acres	100	25 00	2,500 00	381·15	25 00	9,528 75
Close cutting..... "	50	30 00	1,500 00	123·99	30 00	3,719 70
Grubbing, including side ditches..... "	200	80 00	16,000 00	266·62	80 00	21,329 60
Solid rock excavation..... C. yds	240,000	1 50	360,000 00	76,800	1 50	115.2 0 00
Loose do ..... "	10,000	0 90	9,000 00	110,000	0 90	99,000 00
Earth excavation, including borrowing..... "	1,000,000	0 33	330,000 00	1,970,000	0 33	650,100 00
Excavation in off-take ditches beyond limits..... "	10,000	0 35	3,500 00	.....	.....	.....
Under drains, per 100 lineal feet..... L. ft.	60,000	10 00	6,000 00	2,800	10 00	280 00
Line tunnels, 15 cubic yards to lineal foot..... "	.....	.....	.....	7,870	9 00	70,830 00
Widening banks..... "	.....	.....	.....	83,102	0 38	31,578 76
Howe Truss-bridges, 100 feet clear..... Spans	4	4,000 00	16,000 00	.....	.....	.....
Howe Truss-bridges, 80 feet clear..... "	2	2,800 00	5,600 00	2	2,800 00	5,600 00
Howe Truss-bridges, 60 feet clear..... "	6	2,100 00	12,600 00	1	2,100 00	2,100 00
Howe Truss-bridges, 40 feet clear..... "	6	1,200 00	7,200 00	.....	.....	.....
Crib-work in abutments and piers..... C. yds	9,000	4 00	36,000 00	2,950	4 00	11,800 00
Rip-rap..... "	2,000	2 50	5,000 00	7,960	2 50	19,900 00
Piles..... L. ft.	5,300	0 25	1,325 00	59,800	0 25	14,950 00
Square timber, 16 × 12..... "	14,000	0 50	7,000 00	18,700	0 50	9,350 00
do 12 × 12..... "	96,000	0 40	38,400 00	91,400	0 40	36,560 00
do 12 × 6..... "	4,000	0 20	800 00	3,900	0 20	780 00
do 9 × 8..... "	45,000	0 20	9,000 00	77,600	0 20	15,520 00
do 9 × 6..... "	28,000	0 18	5,040 00	29,800	0 18	5,364 00
Hemlock or spruce plank, per 1,000 feet..... B. M.	11,000	16 00	176 00	.....	.....	.....
Pine plank, per 1,000 feet..... "	32,000	20 00	640 00	41,400	20 00	828 00
Hardwood plank do ..... "	4,000	20 00	80 00	.....	.....	.....
Flatted timber, 8 inches..... "	.....	.....	.....	25,300	0 20	5,060 00
Sheet piling..... "	.....	.....	.....	11,200	30 00	336 00
Wrought iron, bolts, spikes, &c..... Lbs.	49,000	0 10	4,900 00	71,600	0 10	7,160 00
Cast iron..... "	10,000	0 10	1,000 00	37,400	0 10	3,740 00
Ties..... Per tie	240,000	0 26	54,600 00	241,000	0 26	62,660 00
Track-laying..... Per mile	112	300 00	33,600 00	102	300 00	30,600 00
Ballasting..... C. yds	180,000	0 38	68,400 00	198,898	0 38	75,581 24
Points and crossings..... Each.	24	50 00	1,200 00	15	50 00	750 00
Total.....	.....	.....	1,037,061 00	.....	.....	1,310,266 05
Estimate of work to be done:—						
Widening banks.....				80,600	0 38	30,628 00
Ties.....				2,000	0 26	520 00
Tracklaying.....				1,387	300 00	4,161 00
Ballasting.....				100,227	0 38	38,086 26
Points and crossings.....				11	50 00	550 00
Iron and timber as per McLennan's statement.....						494 32
Total.....						74,439 58
Grand Total.....						1,384,645 63

ADDENDA No. 7.

MEMORANDUM.—Contract No. 15.—Grading and Bridging, Cross Lake to Keewatin—length, 36½ miles; Track-laying and Ballasting, Selkirk to Keewatin—length, 133 miles.

Description of Work.	As per Schedule on which Contract was based.			As Executed to February, 28th, 1879.		
	Quantities.	Rate.	Amount.	Quantities.	Rate.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.
Clearing ..... Acres	500	30 00	15,000 00	126·17	30 00	3,785 10
Close cutting ..... "	20	50 00	1,000 00	2·07	50 00	103 50
Grubbing, including side ditches and off-take drains ..... "	50	80 00	4,000 00	13·20	80 00	1,056 00
Solid rock excavation ..... C. yds	300,000	2 75	825,000 00	341,376	2 75	941,534 00
Loose do ..... "	30,000	1 75	52,500 00	46,711	1 75	81,744 25
Earth excavation (including borrowing) ..... "	80,000	0 37	29,600 00	224,306	0 37	82,993 22
Earth excavation under water ..... "	.....	.....	.....	355	1 11	394 05
Excavation in off-take drains beyond railway limits ..... "	20,000	0 45	9,000 00	2,264	0 45	1,018 80
Under-drains ..... p. 100 l. f.	10,000	55 00	5,500 00	1,058	55 00	581 90
Bridge, Howe Truss .....40' clear span	1	600 00	600 00	.....	.....	.....
Line tunnels. 15 c. yds. to lin. ft.... L. ft.	425	30 00	12,750 00	332	30 00	9,960 00
Stream do 20 ft., 12 c. y. do .... "	200	26 00	5,200 00	.....	.....	.....
do 16 8 do ... "	160	18 00	2,880 00	.....	.....	.....
do 12 4 do ... "	320	14 00	4,480 00	.....	.....	.....
do 8 2 do ... "	450	9 00	4,050 00	18	9 00	162 00
do 6 1 do ... "	1,300	7 00	9,100 00	.....	.....	.....
Rip-rap ..... C. yds	1,000	2 00	2,000 00	.....	.....	.....
Bridge masonry ..... "	2,400	11 00	26,400 00	.....	.....	.....
Crib-work, in abutments and piers of bridges ..... "	380	2 75	1,045 00	1,070	2 75	2,942 50
Square timber, 16 × 12 ..... L. ft.	500	0 33	165 00	.....	.....	.....
do 15 × 12 ..... "	84,000	0 30	25,200 00	.....	.....	.....
do 15 × 9 ..... "	84,000	0 30	25,200 00	.....	.....	.....
do 12 × 12 ..... "	1,000	0 30	300 00	27,532	0 30	8,259 60
do 12 × 9 ..... "	20,000	0 28	5,600 00	220	0 28	61 60
do 12 × 6 ..... "	140,000	0 28	39,200 00	.....	.....	.....
do 9 × 9 ..... "	245,000	0 25	61,250 00	.....	.....	.....
do 9 × 8 ..... "	225,000	0 25	56,250 00	1,258	0 25	314 50
do 9 × 6 ..... "	.....	.....	.....	15,181	0 25	3,795 25
do 9 × 4 ..... "	.....	.....	.....	1,436	0 20	387 20
do 6 × 4 ..... "	84,000	0 20	16,800 00	.....	.....	.....
Round timber, 12 × 12 ..... "	260,000	0 18	46,800 00	.....	.....	.....
do 12 × 10 ..... "	44,000	0 17	7,480 00	.....	.....	.....
do 12 × 9 ..... "	16,000	0 17	2,560 00	.....	.....	.....
do 12 × 6 ..... "	81,000	0 12	9,720 00	.....	.....	.....
do 12 × 4 ..... "	14,000	0 10	1,400 00	.....	.....	.....
do 9 × 9 ..... "	74,000	0 12	8,880 00	.....	.....	.....
do 9 × 6 ..... "	198,000	0 10	19,800 00	.....	.....	.....
do 9 × 4 ..... "	15,000	0 08	1,200 00	.....	.....	.....
do 6 × 4 ..... "	29,000	0 06	1,740 00	.....	.....	.....
Flatted timber, 8" ..... "	1,000	0 12	120 00	2,605	0 12	312 60
Plank, hemlock or spruce, 1000 f.... B. M.	645,000	12 00	7,740 00	.....	.....	.....
do pine ..... " "	1,000	25 00	25 00	.....	.....	.....
do hardwood ..... " "	1,000	20 00	20 00	.....	.....	.....
Wrought iron—bolts, spikes..... Lbs.	925,000	0 13	2,250 00	2,100	0 13	273 00
Cast iron ..... "	10,000	0 10	1,000 00	3,130	0 10	313 00
Ties ..... per tie	270,000	0 40	108,000 00	266,668	0 40	106,667 20
Track-laying ..... per mile	116	290 00	33,640 00	69·5	290 00	20,155 00
Ballasting ..... C. yds	186,000	0 33	61,380 00	22,946	0 33	7,572 18
Points and crossings ..... each	26	10 00	260 00	.....	.....	.....
Extra haul	.....	.....	.....	.....	.....	1,636 31
Wages with 15 per cent. added	.....	.....	.....	.....	.....	204 70
Material delivered	.....	.....	.....	.....	.....	3,845 40
Total	.....	.....	1,594,085 00	.....	.....	1,279,972 86
Estimated cost of work to be done	.....	.....	.....	.....	.....	1,245,027 14
Total	.....	.....	.....	.....	.....	2,525,000 00

ADDENDA No. 8.

MEMORANDUM.—Canadian Pacific Railway—Red River to Cross Lake—Contract No. 14.

Description of Work.	As per Schedule on which Contract was based			LAST ESTIMATE, TO 30TH NOVEMBER, 1878. Executed by Sifton & Ward.			LAST ESTIMATE, TO 28TH FEBRUARY, 1879. Executed by Joseph Whitehead.			Total by Sifton, Ward and Whitehead.		
	Quantities.	Rate.	Amount.	Quantities.	Rate.	Amount.	Quantities.	Rate.	Amount.	Quantities.	Rate.	Amount.
		$ cts.	$ cts.		$ cts.	$ cts.		$ cts.	$ cts.		$ cts.	$ cts.
Clearing ..... Acres.	1,000	5 00	5,000 00	214	5 00	1,070 00	.....	.....	.....	214	5 00	1,070 00
Close cutting ..... "	100	40 00	4,000 00	274	40 00	10,960 00	.....	.....	.....	274	40 00	10,960 00
Grubbing, including side ditches.. "	200	60 00	12,000 00	337	60 00	20,220 00	.....	.....	.....	337	60 00	20,220 00
Fencing ..... Per 100 lin. ft.	200,000	6 00	12,000 00	203,300	6 00	12,198 00	.....	.....	.....	203,300	6 00	12,198 00
Solid rock excavation..... C. yds.	10,000	2 00	20,000 00	33,738	2 00	67,476 00	704	2 00	1,408 00	34,442	2 00	68,884 00
Loose do ..... "	3,000	1 00	3,000 00	36,720	1 00	36,720 00	.....	.....	.....	36,720	1 00	36,720 00
Earth excavation, including borrowing..... "	1,000,000	0 26	260,000 00	1,528,665	0 26	397,452 90	25,766	0 40	10,306 00	1,528,665 25,766	0 26 0 40	397,452 90 10,306 40
Excavation in off-take drains beyond railway limits..... "	40,000	0 23	9,200 00	87,163	0 23	20,047 49	.....	.....	.....	87,163	0 23	20,047 49
Earth excavation, under water... "	.....	.....	.....	3,378	0 78	2,634 84	.....	.....	.....	3,378	0 78	2,634 84
Under drains... ..... Per 100 lin. ft.	20,000	50 00	10,000 00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bridges, Howe Truss, 100ft. clear span	3	4,000 00	12,000 00	3	4,000 00	12,000 00	.....	.....	.....	3	4,000 00	12,000 00
Bridges, Howe Truss, 80 ft. clear span	1	3,000 00	3,000 00	1	3,000 00	3,000 00	.....	.....	.....	1	3,000 00	3,000 00
Bridges, Howe Truss, 60 ft. clear span	1	2,500 00	2,500 00	1	2,500 00	2,500 00	.....	.....	.....	1	2,500 00	2,500 00
Crib work in abutments and piers, including timber and stone filling ..... C. yds	2,500	3 00	7,500 00	2,808	3 00	8,424 00	.....	.....	.....	2,808	3 00	8,424 00
Rip-rap..... "	12,000	4 00	4,800 00	1,325	4 00	5,300 00	.....	.....	.....	1,325	4 00	5,300 00
Piles driven ..... Lin. ft	2,400	0 50	1,200 00	25,173	0 50	12,586 50	.....	.....	.....	25,173	0 50	12,586 50
Timber, square, 16 × 12..... "	6,000	0 60	3,600 00	3,625	0 60	2,175 00	.....	.....	.....	3,625	0 60	2,175 00
do 12 × 12..... "	55,000	0 40	22,000 00	18,880	0 40	7,552 00	.....	.....	.....	18,880	0 40	7,552 00
do 12 × 6..... "	1,000	0 25	250 00	60	0 25	15 00	.....	.....	.....	60	0 25	15 00
do 9 × 6..... "	2,000	0 25	500 00	6,442	0 25	1,610 50	.....	.....	.....	6,442	0 25	1,610 50

do	12 × 9	"				1,664	0 35	582 40				1,664	0 35	582 40			
do	9 × 8	"				11,568	0 30	3,470 40				11,568	0 30	3,470 40			
do	6 × 6	"				642	0 20	128 40				642	0 20	128 40			
Flatted timber, 8 in		"	24,000	0 20	4,800 00	9,267	0 20	1,853 40				9,267	0 20	1,853 40			
Hemlock or Spruce plank,	per 1,000 ft. B.M.		10,000	50 00	500 00												
Pine	do		8,000	50 00	400 00	9,924	50 00	496 20				9,924	50 00	496 20			
Hardwood plank	do		5,000	50 00	250 00	870	50 00	43 50				870	50 00	43 50			
Wrought iron	Lbs.		20,000	0 20	4,000 00	22,637	0 20	4,527 40				22,637	0 20	4,527 40			
Cast do	"		3,000	0 15	450 00	5,449	0 15	824 85				5,499	0 15	824 85			
Extra haul								4,783 15						4,783 15			
Wages, with 15 per cent added								2,337 21						2,337 21			
Timber delivered (see bill)								1,361 81						1,361 81			
Special works, as per account								2,784 45						2,784 45			
Total					402,950 00			647,135 40			11,714 00			658,849 80			

ESTIMATE OF WORK TO BE DONE.

Solid rock excavation	5,796	2 00	11,592 00
Earth	109,234	0 40	43,693 60
Rip-rap	2,000	4 00	8,000 00
Total			63,285 60
Grand Total			723,134 40